Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS

VOLUME XII. NEW-YORK, SEPTEMBER 27, 1856. NUMBER 3.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Fulton street, N. Y. (Sun Buildings.)
BY MUNN & CO.
O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns in the United States.
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Progress in Ireland.

Ould Ireland seems to be in a very prosperous condition at present. An entire change has come over that country since 1848. Hundreds of mortgaged estates have been sold, and many English and Scotch farmers have purchased largely, introduced great improvements in agriculture and education, and have implanted a new spirit of enterprise in the Emerald Isle. Manufactures have also received a new impulse, and peace reigns from the Giant's Causeway to Galway Bay.

Lord Carlisle, formerly Lord Morpeth, who is well known personally in the United States, is Viceroy, and in an address which he lately made at a banquet, he stated that since 1848 176,000 acres had been drained by a Board of Works, and double that amount by private enterprise, making altogether 528,000 acres.

There have been an increase of 83,000 acres of wheat in one year, 114,774 acres of grass and potatoes, and 9,000 acres of flax. Since 1855 there have been an increase of 75,000 horses, 25,000 cattle, and 90,000 sheep These statistics speak well for the improvements made in this once unhappy country.

Saving Bacon.

As the season will soon be at hand, for our farmers to lay up their usual stock of bacon the following from a correspondent of the *New England Farmer* may serve a good purpose:—

"He was once entertained at the house of a friend, and at dinner he had reason to compliment him on the excellent quality of his bacon, and inquired to know his method of preparing and preserving. He stated that it was his practice to slice and fry his bacon immediately on its being cured, and then pack it down in its own fat. When occasion came for using it, the slices, slightly refried, had all the freshness and flavor of new bacon just prepared. In this way our friend had always succeeded in "saving his bacon" fresh and sweet, through the hottest weather."

Improved Harvester.

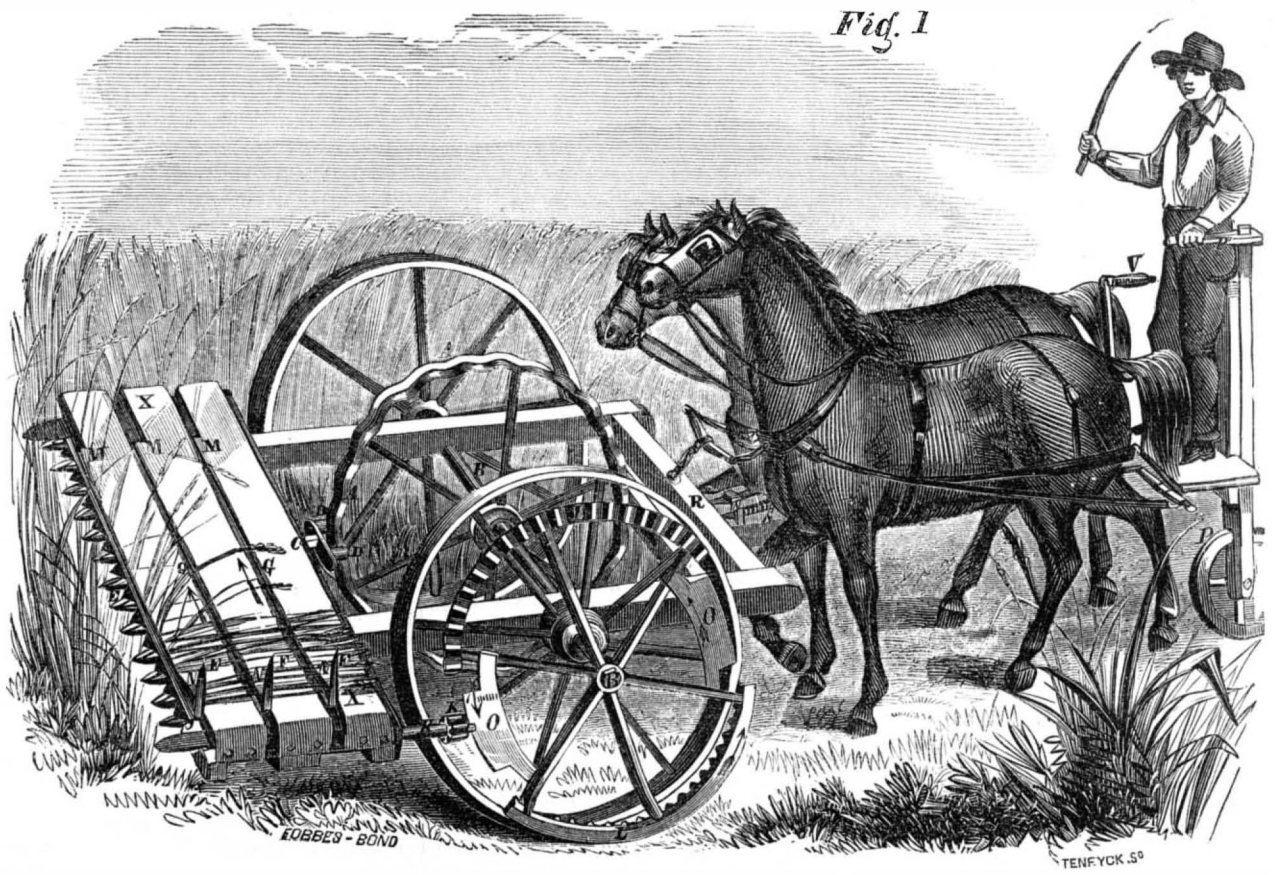
Our engraving exhibits an improved harvester, containing several novel features, of which the most notable is the method of raking the grain from the platform and depositing it in regular bundles upon the ground, ready for the binder.

The sickle bar and its cutters are operated by means of the cam wheel, A, which is attached to the axle shaft, B, and with it revolves. The edges of the cam wheel are grasped by a forked lever, C, the prongs whereof are furnished with friction rollers, D, that bear against the cam surfaces of A. Lever C extends from the cam wheel to the sickle bar, E, with which it is connected. Lever C is pivoted at a suitable point on the under side of the platform, so that when cam wheel A revolves, it causes lever C to vibrate with great rapidity, which motion is transmitted direct to the sickle bar, E. This method of operating the sickles is simple, avoids cogged gearing, and is said to operate extremely well.

The raking is done by the rake teeth, F, which alternately rise at one end of the platform, and project up through the slots, G; they then sweep across the platform in the direction of the arrow, carrying along all the grain that has fallen in front of them, and throwing it off upon the ground; the teeth then disappear to rise at the opposite end of the platform and repeat the operation.

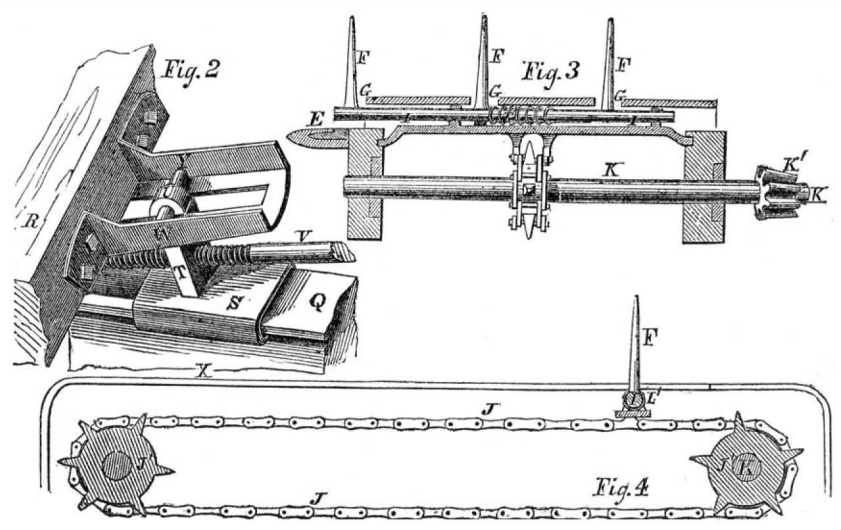
IMPROVED SELF-RAKING HARVESTER.

Fig. 1



The teeth, F, are attached to a spring bar, I, (see figs. 3 and 4,) and the latter is fastened to the surface of an endless chain, J, which is stretched on rollers J, beneath the platform. The belt is put in motion by the shaft K, one end thereof being furnished with a pinion, K′, which gears with the segment racks, L fig. 1. The latter are attached by means of spokes to the main axle shaft, B, with which they revolve. The racks, L, it will be observed, are reversed, the teeth of one being turned outward, and of the other inward. Consequently, as the racks revolve, they turn the roller, K, first in one direction and then the reverse. The belt, J, is thus made to carry the rake teeth, F, across the platform, so as to sweep off the grain; the motion of the belt is then reversed, and the teeth again brought back.

We have stated that the teeth projected up through the slots in the platform when they swept across its surface and removed the grain, but disappeared out of the way, during the return movement, and again rose for a new sweep. This is done as follows: the slots, G,



it will be seen, are wider at their ends than elsewhere. The bar, I, has a constant tendency, caused by its spring, I′, to move sidewise in the direction of the arrow, and also to keep the teeth, F, erect, (fig. 2.) When the teeth, F, arrive at the end of the platform, X, where the slots are widest, they spring sidewise, and the return or reverse movement of the belt, carries them against the square shoulders, M, of the grooves, which causes the teeth to bend over and pass under the platform. When the teeth have arrived at the other side of the platform, where the grooves are under, they rise erect again. There are no shoulders at this end of the platform to knock them down, but simply an easy curve, N, which guides them from the under part of the groove to the rammer. A reel of the ordinary kind is attached to the machine, but it is purposely omitted in our cut, in order to show other parts more clearly. O are thin guide plates located between the racks, L, and revolving with them. The extremity of roller shaft K is slotted, and the office of the guide plates is to enter the slot and hold the shaft, K, still and in position, so that the pinion, K′, and rack teeth will strike properly into gear when they meet.

The driver rides on a platform at the rear of the machine, and guides the machine by means of wheel, P, operated by tiller P′.

The method of raising and lowering the cutters so as to cut closer or higher from the ground, is shown in fig. 3. The rear tongue, Q, and frame, R, are connected by means of a sliding stop, S, the upper portion of which, T, forms a nut, through which screw rod V passes. The top of nut T is provided with an eye or link, U, which passes through a slot in the ear piece, W, and a bolt, Y, through the eye completes the connection. When the length of the cutters is to be altered, the driver moves crank V′, and turns screw rod V. This causes the stop, S, to advance or recede, according to the direction in which the crank is turned, and thus lifts or depresses the frame, R, the opposite end of the frame, on which the platform and cutters are located, being correspondently moved.

The machine cuts a swath ten feet wide, is comparatively easy for horses, and operates with entire success, doing its work in a superior manner. It is spoken of in the highest terms. The arrangement of the parts is simple, and the machine, as a whole, durable, easily managed, and highly effective. For further information address the inventors, Messrs. Haggard and Bull, Bloomington, Ill. Patented Dec. 11, 1855.

McDougal's Disinfecting Powder.

We received some packages of the above-named powder (advertised in our columns) from E. B. Haynes, Beekman st., this city, with a request that we would make experiments with it. We have done so, and found it effectual in removing obnoxious odors arising from drains, &c. It has an unpleasant odor itself, resembling gas-house lime; but this is not unhealthy, and it passes off in a day or two.

The steamboat *Sovereign* exploded her boilers on the 16th inst., at Chester, on the Ohio river. Two persons were killed, and the steamboat *Audubon*, lying alongside of her was sunk.

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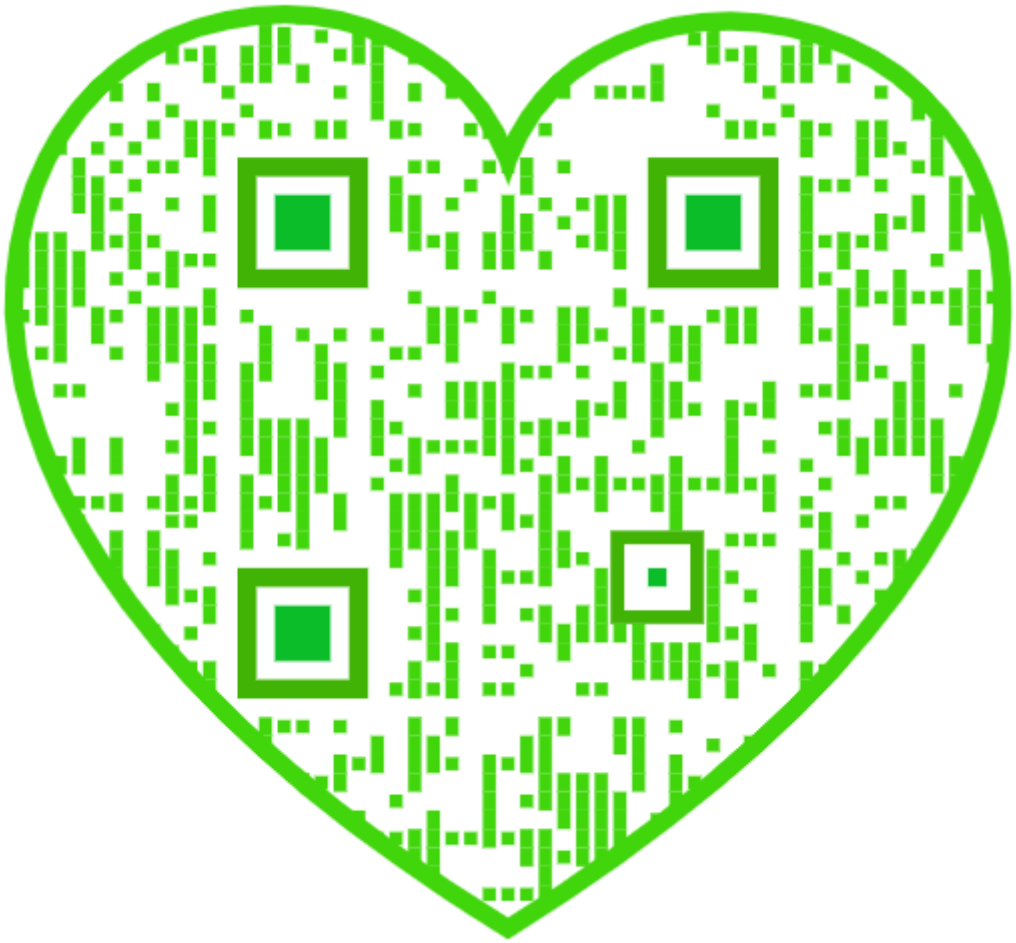

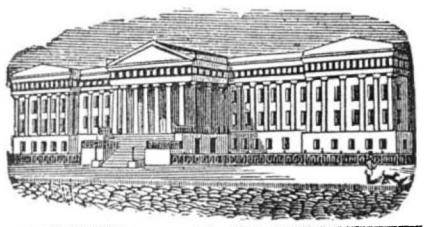

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING SEPTEMBER 16, 1856.

CHIMNEY CAP—Wm. Brownelle, of Newport, R. I.: I claim the described construction and arrangement of the ventilator, for the purposes specified.

DRESSING FELLIES—Wm. M. Bulloch, of Marcy, Ind.: I claim the rotating ring or band, G, placed within the stationary ring or band, F, the ring or band, G, having the cutter head shaft, E, fitted to it, the shaft, E, being rotated by the gearing, C D, as shown and described, for the purpose specified.

FEED MOTION FOR SHINGLE MACHINES—John Broughton, of Chicago, Ill.: I do not claim the disk wheel, D, with knives attached, for that device has been previously used.

But I claim the disk wheel, D, with knives, F, face guide, G, and face cam, K, attached and used in connection with the vibrating bed, H, the whole being arranged and operating as shown, for the purpose set forth.

HEADING BOLTS—Ebenezer and Philemon Coleman, of Philadelphia, Pa.: We claim the levers, H H, with rollers, h h, attached to them, and the ratchet roller, i, attached to the pendant plate, G, the above parts being arranged and operated as shown, for the purpose specified.

We further claim the heading die, E, and jaws, F F, provided with dies, e e, when arranged as shown, so as to operate conjointly with the rollers, h h and i, for the purpose set forth.

DENTISTS FORCEPS—John G. Coates, of Big Lick, Va. I claim constructing forceps with rotating beaks, to adapt themselves to the exterior formation of the tooth, substantially as and for the purposes specified.

SAW SET—Abraham Casey, of New York City: I claim the combination and arrangement of the stock, A, having a transverse kerf, E, bevel bolster, D, and punch, B, substantially as and for the purpose set forth.

Second, I claim arranging the bolster on a turning screw pin, which moves in a slot, and has a clamping nut, substantially as and for the purpose described.

REEFING SHIP'S SAILS UPON EXTRA YARDS—Joseph S. Foster, of Buffalo, N. Y.: I claim the double yard, H H H, or extra yard of two pieces, placed about midway between the upper and lower yards, the sail passing between the two pieces, operating in the manner and for the purpose set forth.

FIRE-ARMS—Edmund W. Graham, of Manchester, N. H.: I claim, first, arranging the chambers in which the powder is placed and the chambers in which the ball is placed, at right angles to each other, or nearly so, and so as to communicate with each other, as described, and for the purpose specified.

Second, I claim covering each powder chamber at the time of the discharge, with a protecting cap or plate, as described.

HARVESTERS—Wm. Gage, of Buffalo, N. Y.: I claim raising and lowering the finger bar and cutters by means of swinging the outside frame, to which the finger bar is attached, upon two pivots upon the inside frame, and holding the same where placed by means of the serrated plates, E E, and tightening rod, d d, when said frames are constructed and arranged to operate in relation to each other, and the driving wheel, finger bar, and cutters, in the manner and for the purposes set forth.

I do not claim a board set edgewise and upon an angle inward, when the same is not combined with the wheel, W, and used for mowing, whether fixed immovably to finger bar or hung upon a hinge.

Neither do I claim a mold board or a dividing board, when combined with and fixed on a platform, and used for reaping.

But I claim the peculiarly adjustable mold board, z y, in combination with the wheel, W, and its supporting arm, x y, when used in mowing, for the purpose of protecting the wheel and arm from loose grass, and prevent its lodgment thereon, when the above parts are constructed and arranged in the manner described.

PREPARATION OF HIDES FOR TANNING—George W. Hatch, of Princeton, Ill.: I do not claim the use of pyroligneous acid as such, but confine my claim to the use of smoke from wood or other equivalent combustibles, in the preparation of hides for rapid tanning, as set forth.

ATTACHING SHAFTS TO SLEIGHS—George Kenney, of Milford, N. H.: I claim attaching the shafts, C C, to the runners of the sleigh by means of the eyes, F F, and rods, G H, said eyes and rods being attached to the cross pieces, B D, provided with springs, I I, the whole being arranged as shown, for the purpose set forth.

GRANULATING METALS—John Feir, of San Francisco, Cal.: I claim the use of the outer and inner vessel, 1 and 2, when constructed and operated in the manner described, in connection with the pipe, 3, and its elbows, as set forth, for keeping the water in circulation, and for granulating the metal.

CUTTING PAPER—Harvey Law, of New York City: I claim the combination of the rising and falling platform, C, and clamping frame, E, by means of toggles, F F', said toggles having cranks, G G', connected with them, the pintles of which work in curved grooves, or otherwise actuated, substantially so, and for the purposes set forth.

CARPENTER'S BENCH—I. W. Mahan, of Lexington, Ill.: I claim the carpenter's and cabinet-maker's assistant bench, constructed in any manner substantially the same as set forth.

PRINTING PRESS—A. & B. Newbury, of Windham Center, N. Y.: We claim, first, the rotating and reciprocating printing cyltnder, E, operated by means of the endless racks, C, pitman, I, and bars, b, arranged as shown and described.

Second, we claim the revolving fly, U, constructed, arranged, and operating as set forth.

CHURNS—Albert Pease, of Weston, Vt.: I claim the combination of the two fixed boards on the dasher handle, and a sliding board, or its equivalent, moving between them, substantially as described, disclaiming the use of two fixed boards, except in the combination specified.

LOCOMOTIVE AND STEAM BOILER FURNACE—Wm. P. Parrot, of Boston, Mass.: I am aware that perforated plates for the admission of air have been used in connection with hollow bridges, but in working with a rapid draft the smoke and gases in the fire box or furnace are not properly mixed with the air so as to complete the combustion. I do not, therefore, claim any such combination or arrangement of parts.

But I claim the hollow box or cone, having tubes for the passage of the smoke and gas, and apertures for the admission of heated air, so arranged, in the manner substantially as set forth, as intimately to mix the two, for the purpose described.

CLEVIS—Edwin A. Palmer, of Clayville, N. Y.: I do not claim any part of the common clevis.

But I claim the pin provided with a spring, and arms, E E, in combination with the projection in the head, and openings through which the arms may pass, and the recesses, I I, arranged substantially as and for the purposes set forth.

VARIABLE CUT-OFFS FOR STEAM ENGINES—Charles H. Reynolds, of Lewistown, Me.: I claim the arrangement of the suspended lifting rods, F F, with their studs, m m, secured to the valve rod or rods, and operated on by the arms, I I, of a rock shaft, and the plate or plates, C, with beveled edges, g g, sliding on the said valve rod or rods, said plate or plates being operated on by the governor, and operating on the lifting rods, substantially as described.

COTTON PICKERS—B. G. Shields, of Marlin, Texas: I claim as an improvement on the patent of George A. Howe, of the 4th December, 1855, the application of a fan or fans to the gathering chain, as a means of removing the gathered cotton from said chain, and this I claim whether said fans be used as set forth, or in any other way substantially the same.

SHINGLE MACHINE—P. O. Sherwin, of Jamestown, N. Y.: I claim the stops, K K, in combination with the notches or teeth, t t, on the set wheels, arranged and used for the purposes and substantially as set forth.

HARVESTING MACHINES—George W. Tolhurst, of Cleveland, Ohio: I am aware that continuous zig-zag slots or ledges have been used, of various kinds: but when these become damaged by wear they are irreparable. I do not claim any of these.

But I claim the combined use of the single row of removable pins with the adjustable angular slot, j, for the purpose of procuring a vibratory motion, to be applied to the cutters as set forth.

RIDING SADDLES—Pascal Plant, of Chicago, Ill.: Disclaiming entirely the primary principle of applying spiral springs to saddles, and also disclaiming the use of enclosed compressed air spring saddles, both principles of which have long since been well known and used.

I claim the distinguishing features of improvement, the sockets, A B, and vertical shanks, F F, provided with immovable springs, g g, arranged in the manner and for the purposes specified.

SHINGLE MACHINE—David D. Tupper, of Boston, Mass.: I claim the described method of arranging and operating the cutter head, whereby the pressure rolls are inclined, to correspond to the inclination of the face of the bolt, for the purposes set forth.

IRON FENCE POSTS AND TIES—John B. Wickersham, of New York City: I claim the double ripped post or tie, cornered and mortised upon opposite and corresponding sides, as specified, in combination with the inclined corner key, E, for holding and crimping the rail, as described

Second, I claim so constructing the fence tie and key above named that it may be attached to a wood in order to take up the lax tension of wire and flat hoop iron, and thus act as a compensator for the expansion of the metal when used for fences, as set forth.

SELF-ACTING RAKES FOR HARVESTERS—J. Whitehead, of Manchester, Va.: I claim the combination of the swinging arm, I, and traveling carriage, J, moving together and independent of each other, by means substantially such as described and for the purpose set forth.

I also claim the locking arm, I, at each end of its transverse movement, so that the rake cannot swing around while the carriage, J, and rake, L, reciprocate together and discharge the gravel, substantially as described.

RE-ISSUE.

FOLDING LIFE-BOATS—C. Loeker, of New York City. Patented Jan. 7, 1855: I do not claim hinging or pivoting the ribs to a keel or to a central frame.

But I claim the chain or chains, or their equivalents, as connected and arranged in relation to the stern and stern posts, ribs, and central frame, and operated as set forth.

DESIGNS.

STOVES—Garretson Smith, Henry Brown, and James A. Read, (assignors to Cox, Hager & Cox,) of Philadelphia, Pa.

FLOOR CLOTHS—Antoine Glowinski, (assignor to D., A. E. & N. B. Powers,) of Lansingburg, N. Y.

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ADDITIONAL IMPROVEMENT.

FIRE-ARM—Frederick D. Newbury, (assignor to Richard Varick De Witt,) of Albany, N. Y. Patented Aug. 12th, 1856: I claim the placing the hammer and trigger with their springs within the arm, D.

I claim the cocking of the hammer by the movement of the arm, D, and the aid of stud, S, or its equivalent.

I claim the placing of the tape priming under the barrel and in front of the cone, the same to be brought properly on to the cone by the movement of the arm D.

I also claim the placing of the tape priming, and operating the same as described, in combination with the arm, D.

American Association for the Advancement of Science.—(Concluded from page 11.)

Storms and Ventilation.—Dr. Reid, of Edinburgh, exhibited the operation of an Argand gas-burner, with a glass chimney, an apparatus being attached under the burner, by which he could regulate at pleasure the amount of air going inside, or that going outside of the flame, producing thus the most singular and complicated rotatory motions of the burning gas and floating specks of lampblack. He then gave a brief account of the numerous experiments which he had tried concerning the rotary motion of the air under a great variety of circumstances, and showed how the results might aid us in forming a theory of storms, but more particularly how it would aid in general theories of physics, and in special arrangements for ventilation. The difficulty in architecture is that the same mind that plans the warming and ventilating apparatus does not plan the general form and adaptations. Another place where the rotary currents are of great importance is in the ventilation of mines, where they may be studied to advantage, and used to promote the health of the miners. Nothing is more interesting to man than the atmosphere in which we live—an ocean without geographical limits—in which, and by which we all live, ceaseless in motion, from a great variety of causes, and each movement directly affecting the comfort and health of man.

Every house should be so constructed and arranged as to have a sufficient supply of pure air, as its inmates require an adequate supply of oxygen to support respiration, and if this is not obtained, the health must be injured. How few houses are built with reference to this great principle of health.

Aneroid Barometers.—Prof. Guyot read a paper on this subject, in which he expressed views of great importance in reference to the character of such instruments. He acknowledged its great conveniences, but against dependence on it for nice measurements of mountain altitudes he entered his formal protest. He had made many experiments and comparisons with good mercurial barometers, and found them worthy of reliance as a scientific instrument, only under the condition that it is kept stationary, and individually tested to learn the correctness for temperature, &c. Had he trusted to his aneroid barometer in his recent visit to the Black Mountains, he would have been led to errors of 400 to 500 feet, as was proved by the two good mercurial barometers that he carried. A traveler who carries an aneroid alone with him, must not expect accuracy within two or three hundred feet. Simply from motion or from having been subjected to great changes of pressure, it will change its zero without giving any external indication.

N. B. Webster exhibited a chart on which were three curves, representing the mortality at Portsmouth, Va., during the months of July, August, September, and October, 1855; the variations of the thermometer and of the barometer. On the charts were also indications of the atmosphere, the lightning, and the winds, so that the inquirer could study all these points at once. The day of greatest mortality was Sept. 1,—one-tenth of the white population then in the town died in one week. Not sixty white persons who remained in town escaped the fever, and but 37 per cent. of the patients survived. Among the blacks only 3 per cent. died.

The Gyroscope.—Prof. Rogers read a paper on this philosophical toy. He said these instruments have lately attracted a good deal of attention. They consist essentially of a wheel which may be made to rotate very rapidly at the end of an axis, which is balanced on a swivel joint at the top of a vertical post. If, while the wheel is rotating, the axis is thrown out of balance, by means of a sliding weight, the axis begins to rotate in a horizontal direction round the post. This is the simplest form, but others more complicated are to be found. They were first made by Prof. R. W. Johnson, of Philadelphia, and had recently been revived in France. The French mathematicians acknowledge Prof. Johnson as the inventor. He published an article in *Silliman's Journal*, about twenty-five years ago, describing his apparatus. Professor Rogers then explained the cause of the secondary rotation by the method of the combination of rotations, and by the doctrine of couples of forces. He wished to divest the theory, if possible, of the forms of the calculus, and present it in the beautiful geometrical manner in which the theory of the parallelogram of rotations enables it to be stated.

Upon the conclusion of this paper a debate sprang up, which consumed a very disproportionate time of the meeting. Prof. Bartlett gave an explanation of the toy, starting from a different foundation; and some of the members supposing—as Prof. Rogers himself appeared to do—that Prof. Bartlett doubted the theory advanced in the paper, many needless words were uttered upon the subject. At length Prof. Rogers acknowledged the truth of several of the views which he had at first supposed were contradictory to his own, and Prof. Peirce, who had not yet spoken, closed the discussion by a simple statement of the real points of the case. He observed that Prof. Lovering had recently presented a complete discussion of the question to the American Academy; that the whole theory of it was in fact contained in that of the common top; and as for the antiquity, the same theory was long ago presented by one Isaac Newton. [Laughter.] Prof. Rogers said that he was aware of this similarity of the theory of the Gyroscope to that of the top, and of the precession of the equinoxes, and had prepared diagrams to illustrate these subjects, and also the experiments of Foucault on the pendulum, which he would have shown to the Association as illustrations of his paper, had he thought that there would be time. Prof. Henry remarked that the same problem was found in gunnery, when a rotary motion—as in the rifle—is given to the ball.

We published on page 200, Vol. 11, SCIENTIFIC AMERICAN, an engraving of the above-named philosophical toy, gave a brief description of it, and made a few remarks concerning the nature of its peculiar action, stating that the same laws which governed its motions reigned among the stars. That article soon attracted universal attention; gyroscopes were obtained by all the mechanical and scientific institutions in our country; by numerous clubs, and hundreds of private persons, and it formed a theme of wide-spread discussion; and on another column, our readers will perceive that it formed a question for discussion to the mathematicians of the American Academy of Sciences, at Cambridge, Mass., as well as the *savans* at Albany. Prior to the illustration of Lane's Rotoscope on the page referred to, we published a short account, on page 138, same volume, of Fessels'.

This beautiful instrument, under the name of the Gyroscope and Rotoscope, is quite old, but has been known to a very limited number of persons; it has, therefore, afforded us much pleasure to have been the means of making a knowledge of it so universal.

Rev. B. Powell, F. R. S., in a lecture on Rotary Motion, delivered before the Royal Society, London, in January, 1854, explained the action of the Rotoscope with a model, and presented the same views respecting its motion and those of the heavenly bodies as Professor Rogers. The following is an extract from his lecture:—

"It always affords a sort of intellectual surprise to perceive for the first time the application of some simple and familiar mechanical principle to the grand phenomena of astronomy; to see that it is but one and the same set of laws which govern the motions of matter on earth and in the most distant regions of the heavens; to perceive a celestial phenomenon, vast in its relations both to time and space, and complex in its conditions, identified as to its mechanical cause, with the rotary movement of a little apparatus on the table before us."

The improved gyroscopes manufactured by McAllister & Bro., Philadelphia, Pa., exhibit two other motions beside those shown by one illustrated in the article referred to above. It has a variable balance arm, which will make the wheel or globe revolve in one direction if underbalanced; when balanced it will not revolve, but merely rotate; when overbalanced it will revolve in a contrary direction. It shows the principle of rotary motion discovered by Frisi in 1750, namely, that when a body is rotating about an axis and any cause tends to make it rotate about another axis, it will not rotate about either, but about a new axis intermediate to the two. These apparatuses are for sale by McAllister & Co.. and J. W. Queen Philadelphia.

Pennsylvania Polytechnic College.

The citizens of Philadelphia deserve great credit for the establishment of this new and useful institution in their city. It was incorporated in 1853, and we understand that it has already been more successful than was anticipated. The building is in Penn Square, and has been undergoing extensive repairs. The chemical laboratory and apparatus room are on the ground floor. These communicate by dumb waiters with the principal lecture room on the second floor, the appointments of which are exceedingly neat and convenient. Communicating with the lecture room is the Professor's preparing room; north of this is the Faculty's office; and next to this, on the same floor, is the room appropriated to the geological and mineralogical cabinets.

These are arranged under three heads:—1. Geology and Palaeontology. 2. Minerals which are not ores. 3. Ores proper. This classification has proved to be well adapted to instruction in the department of mines—one of the most important in the college. The rooms of the academical department, and those of the Professor of Mathematics and Civil Engineering, are on the third floor; and the fourth is devoted to the class rooms of the Professors of Design and of Mechanics. It is a scientific institution in every sense of the term.

Florida Railroads.

A railroad is now in the course of construction in Florida, for the purpose of uniting the Atlantic with the Gulf. The object of building such a railroad through this Peninsula, is one of far-reaching sagacity, and will ultimately tell upon the interests and prosperity of Florida.

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[For the Scientific American.]

The Hughes Telegraph.

[Continued from page 11.]

In continuing our review, it is necessary to present the claims of the inventor. From his patent, granted May 20, 1856, we copy them as follows:—

"I do not claim any feature of any existing printing or marking telegraph, as any part of my invention; nor do I desire to interfere in the least with any heretofore invented. Conceiving that I have made important improvements in telegraphs, I desire protection only for that which is novel and of my own invention.

I claim, first, the holding in place of the attractive power of electro or natural magnetism, as applied to the telegraphic purposes, whether the same be applied in the manner described, or in any similar manner, producing like results.

Second, particularly I claim combining with the permanent magnet, an adjustable spring almost sufficient to sever it from its contact with the soft iron of their electro-magnet, and a lever, or its equivalent, which, after the permagnet has been separated from the iron by the action of a current, shall bring it back again into renewed contact by the action of the power which has been called into action by the retreat of the magnet.

Third, I claim the employment of two cog wheels or circuit breakers at each station, so arranged that one shall be in connection with the electro-magnet at the same station, and the other in connection with the transmitting cylinder at that station, the whole being arranged so that the connection alternates at each station for every letter between the electro-magnet and the transmitting cylinder at that station, in such a manner that the through connection is always simultaneously through the transmitting cylinder of one station, and the electro-magnet of the other station, whereby the machine at each station can, at the same time, be transmitting a message and receiving a message; it being understood, however, that I do not claim, in general, the use of a single wire for the simultaneous transmission of different messages by means of rapid changes of connection, which is not new, but only the peculiar manner as claimed, in which I have applied it in connection with my machine.

Fourth, so arranging a bolt and operating the same by a cam, or its equivaleat, that it shall act upon a wheel attached to the shaft of the type, so as to preclude the intelligence from one station being communicated to any other station or stations on the circuit from which it is desired to withhold the communication.

Fifth, I claim the employment of a vibrating spring properly weighted at its extremity, if necessary, and so arranged by a series of mechanism as to govern and regulate the movement of the type wheel. This I claim also as a governor in other machinery, without limiting its use to its connection with electro-magnetism.

Sixth, I claim printing by electro-magnetism by a continuously moving type wheel, printing while in motion.

Seventh, I claim the arrangement of a cylinder with pins spirally arranged thereon to operate by contact with metallic points to close and break the circuit, when this is combined, for the purposes set forth with the systems of keys and catches, so arranged that any desired point may be thrown into a position, where it will be retained until it is struck by its corresponding pin. D. E. Hughes.

Louisville, Ky."

The specification of the inventor's patent is prefaced by the words: "The nature of my invention consists in the manner of using natural and electro-magnetism in its application to machinery for telegraphic purposes, and in the employment of a vibrating spring for the regulation of this and other machinery." And again it says: "Thus the press and feed wheel are governed by the combined use of natural and electro-magnetism, and the revolutions of the type-wheel are governed by the vibrating spring."

Considering that the application of the combined action of electro and permanent magnetism for telegraph machinery, was known long ago, and is now in use in the greatest variety of constructions, it seems, at the outset, questionable whether the employment of it, by the above-mentioned instrument, yields advantages hitherto unknown, or whether it is so constructed as to evade a conflict with Morse's patent. Morse says: "The essence of my invention being the use of the motive power of the electric or galvanic current, which I call electr-omagnetism, however developed, for making or printing intelligible characters, signs, or letters, at any distance," &c.

It will be observed that the required magnetic attractive power must be so strong as to counterbalance the power of the spring for raising the magnet and working the detent which sets free the crank of the printing clock-work, plus a surplus of power for preventing the voluntary separation of the magnets. A piece of soft iron coming in contact with a magnet, will become magnetic during such process, both attracting each other by having dissimilar polarity, the magnetism of the iron being proportional to the attractive power of the magnet, etc., therefore their reciprocal attraction must be strong enough to prevent a separation from each other. Now, in order to set the permanent magnet at liberty to fly off, the polarity of the iron cores has to be changed so as to be similar with the permanent magnet by electricity, as the specification says. But before this can be done this magneto-magnetism of the cores must be made inefficient by the generating of a sufficient electro-magnetic power with dissimilar polarity in the same iron cores. The electric power required for that purpose has to be of the same intensity as that which had to be used to generate this attractive power, which is to be made inefficient, and would have been already sufficient for the operation without squandering a surplus of it, in order to produce the expected change of the polarity of the iron cores.

The first claim reads thus: "the holding in place of the attractive power of electro or natural magnetism," etc. What does that mean? I find no explanation of it in the specification.

In the second claim are some little things of not much consequence for those who are acquainted with Stoehrer's Relay Telegraph. Referring to the fourth claim, I have to ask, how will it be if more than three instruments are in operation in one circuit, and how, if it is desired, that more than one station receive the communication, and the rest be precluded, as for instance, the New York station, A, Philadelphia, B, Baltimore, C, and Washington, D. Washington communicate with New York and Philadelphia, precluding Baltimore. The second closing and breaking of the circuit, as mentioned in my last communication, will force the bolt through the slot at the instrument of A, not suspending its motion, but pushing against the flange of the instruments B and C, their motion will be suspended. Now, what means are employed to keep the instrument, B, at Philadelphia in motion? And if station A has spoken to B and C, and after this B and C wish to communicate with each other, how is it done?

The fifth claim refers to the employment of the before-mentioned vibrating spring, properly weighted at its extremity, if necessary, etc.

Why *if*? Should it not read *because* necessary? Has the compensating weight and vertical connecting rod no weight? Does not temperature change all the time?

Is it not a well known fact, patent to every body, that if the oscillations of a pendulum require to be very rapid, it must be made in the form of a vibrating spring, so as to have elasticity around its point of equilibrium. The spring pendulum is a very old and well known device.

Having shown the incongruity of the other claims, I cannot, of course, be surprised by the sixth, which reads: "printing by electro-magnetism by a continuously moving type-wheel, printing while in motion." According to the specification, the press lever, operated by the crank, presses against the type-wheel like a brake of a car wheel, and will remain in that position during the dead motion of the tilting crank and of the connecting rod, and will either break the wheel or cause other mischief. Press, for instance, a paper for printing purposes against the periphery of a revolving printing wheel with your hand without either getting injured or arresting its course, and you will understand how utterly impossible it is for any one to print from a type-wheel, while in motion. (Should not the claim read, Printing while stopped, as all the other printing telegraphs do?)

The seventh claim covers a sytem of catches—but the specification does not mention any thing of them. Chas. Kirchhof.

[To be continued.]

American Blister Flies.

Messrs. Editors.—I noticed in No. 51, Vol. 11, Scientific American, an article entitled "Blister Flies in Texas," which article refers to a former correspondent on the same subject. I would state, for the benefit of those whom it may concern, that they are the true Cantharis Vittata, and are described in the United States Dispensatory, as follows: "its length is about six lines. The head is of a light red color, with dark spots on the top; the feelers are black; the elytra or wing cases are black, with a yellow longitudinal stripe in the center, and with a yellow margin; the thorax is also black, with three yellow lines, and the abdomen and legs, which have the same color, are covered with a cinerous down. It inhabits chiefly the potato plant, and makes its appearance about the end of July or beginning of August," &c. They were in great abundance in this region this season, commencing their ravages somewhat earlier than usual, owing to the extreme heat and dryness of the season. They are quite equal to the Cantharis Vesicatoria (or Spanish fly,) for all the purposes for which that insect is used. When we wish to gather them here, we shake them from the plant into a pan of hot water, and afterwards dry them in the sun. When we wish merely to exterminate them, we place straw or hay upon the ground, on one side of the patch, two or three feet wide by one or two inches deep, then commencing on the opposite side, with bushes we drive them until they take shelter under the fuel—the balance you may conjecture. A. Newell.

Paris, Illinois, September, 1856.

Electro-Chemical Baths.

Messrs. Editors—M. Vergnes' last answer to my article, on page 395, Vol. 11, Scientific American, on Electro-Chemical Baths, in place of scientifically refuting, by palpable demonstration, parries off by saying "the irradiations of electricity are subject to the same laws as those of light and heat."

I understand he is acquainted with electro-plating; now I will offer him another proof in his own line of business, corroborative of what I advance, to wit, that the electric current, when free to move, passes at and near the surface of liquids, in preference to descending into them.

Take, for instance, the process of electro-plating with silver; in this process a silver plate is suspended on the positive pole, in the solution, and the article to be plated on the negative pole. Let the plating go on for a few days, and on examining the plate at the positive pole, it will be found that the action of the electric current has entirely decomposed and conveyed to the negative pole the silver at and near the surface of the solution, while the silver plate lower down, has not been decomposed at all. Saml. B. Smith.

New York.

Advice to Manufacturers of Tin Plate

Messrs. Editors—Large quantities of tin plate are used in Philadelphia for roofing, which doubtless you are aware, is put on in a different manner from the New York plan—they cutting each sheet and putting it on separately, and we putting it together on rolls with standing ridges.

The tin, as used by us, is taken from the box, edged without any preparation, and put together in rolls at the shop, and then taken to the roofs; the two sides of the tin, as a general thing, are straight and parallel, but the ends are left apparently as they are rolled. Now if the manufacturers in England made their leaded tin for roofing purposes with the sides and ends straight and parallel, and the angles right angles, or as we say, "square," they would meet with a more ready sale. I should think that while performing the operation, as at present, very simple machinery would effect the purpose; and if *they* could get up nothing to answer their purpose, if they would send word over to some of our inventive Yankees they would soon get what they wanted.

There is a duty of 15 per cent. on tin plates, and yet none are manufactured in our country, and none can be, because, we have little or no tin, and have to import all our block and grain tin. This duty, by increasing its price, prevents, to a great degree, its use as a roofing material. G. R., Jr.

Philadelphia Sept., 1856.

A Simple Microscope.

When a sound eye of the average power neither long-sighted nor short-sighted, examines any object in order to see it most distinctly, the observer places the object at the distance of about *six* inches, and in this position it is seen of its natural size, and is not said to be magnified. If we hold up at this distance a finger three-fourths of an inch broad, it will appear to cover upon a wall ten feet distant a space of fifteen inches. If we hold it up at three inches from the eye, it will cover a space of thirty inches, and will appear *twice* as large, and if we hold it up at the distance of an inch and a half, it will cover a space of sixty inches, and will appear four times as large. But though magnified in these two last positions, it is not seen distinctly, and therefore we see it more imperfectly than at the distance of *six* inches.

If we look at the finger, when seen indistinctly at the distance of three, and one and a half, inches from the eye, through a small pin-hole in a piece of card, it will appear not only magnified, but tolerably distinct, and the distinctness will increase with the smallness of the aperture. The most satisfactory aperture is one made with a needle in a piece of sheet-lead or tin-foil, and when the eye is applied close to it, the vision will be such that discoveries, invisible to the eye, may be made by the observer.

A single sphere of glass, from the twentieth to the fiftieth of an inch in diameter, forms a good microscope, with which many interesting phenomena may be observed, and even important discoveries made. Dr. Hooke seems to have been the first person who made microscopes of this kind. Having taken a clear piece of glass, he drew it out, by the heat of a lamp, into fine threads, and then holding the ends of these threads in the flame, he melted them till they run into a small round globule, which hung to the end of the thread. The globule is then stuck on the end of a piece of wood with the thread cut as short as possible, standing uppermost, and the ends are ground off, first on a whetstone, and then polished on a metal plate with tripoli. When the glass sphere is thus finished, it is placed against a small hole made in a thin piece of metal, and fixed with wax. Thus fitted up it will both magnify and make some objects more distinct than many of the great microscopes.

When a microscope cannot be obtained for some special purpose, a tolerably good *extempore* one may be made by filling with water, or any other limpid fluid, two small bottles, or test tubes, crossing them at right angles, and looking at the object to be examined through the crossed parts.

The Geography of Plants.

In 1820 De Candolle, of Paris, in a celebrated essay on the Geography of Plants, published in the *Dictionary des Sciences Naturelles*, made it the starting point for botanical inquiry, that each species was derived from an individual or pair of individuals, created in one particular locality. This was soon disputed by many botanists, because kindred species of plants, were found so widely separated,—some in islands of the ocean—far distant from the continents where the like species flourished—that it was concluded there must have been numerous pairs of the same species created—each for its own particular locality. In later years, however, the discoveries of geology, tend to confirm De Condolles' views. This science points out the great probability of the submergence of large tracks of once elevated lands, and the upheaval of others, and these explain the occurrence of the same plants in islands, and continents, now completely unconnected.

Decimal Weights and Measures.

The decimal system of weights has just been adopted throughout the whole of the Prussian monarchy, as it had before been in the German Association, and in several States of the south of Germany.

When will a rational system of weights and measures be adopted in our own country? Our law-makers always have plenty of time to make long-winded speeches on party politics, but no time to make a new law, and such a necessary and good one too, to reform our weights and measures.

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New Inventions.

Inventions Wanted.

Calls are made for a number of highly important and useful improvements, which our inventors should lose no time in supplying.

The first is for a new plow, an article of universal demand. We publish an interesting article on the subject, setting forth what is needed, on another column, which inventors will do well to read.

Another much-wanted improvement is a Corn Husker. The husking of corn is now done by hand, at an average expense of five cents a bushel, or *thirty millions of dollars a year!* Think of that, inventors. Thirty millions of dollars annually lost for want of Corn Husking machines.

Machines for cutting down trees are in great demand. Something that can be easily used and transported up hill and down dale, is needed.

Contrivances for milking cows are much called for. It has been satisfactorily settled, we believe, that, by means of a vacuum, the milk may be readily withdrawn. It remains for the ingenious to present the public with compact and convenient inventions for the purpose. There is a greater demand than ever for inventions of all sorts. Patents for good improvements are selling for large sums.

Water-Proof Textile Fabrics.

We have lately examined some specimens of cloth rendered water-proof, but not air-tight, the invention of Benj. Weigart, of this city, who obtained a patent on the 19th of last month. The invention consists in saturating the cloth in a thin solution of sulphate and acetate of alumina, caustic soap, and glue, then drying it. This composition forms an insoluble material when dry, which envelopes the fibers of the cloth, and resists the passage of water through it, except under pressure. Alum and soap has been used in solution to effect the same object, but not combined with glue, which appears to be an improvement.

Tree Cutting Machine

Referring to our engraving it will be seen that the cutting is done by a horizontal saw, which is connected, by means of a rod, or pitman, A, with the fly wheel, B, whose shaft is put in motion by means of gear wheels and cranks, as shown.

The principal feature of novelty consists in the manner in which the saw is held, guided, and fed up against the tree. This is done as follows: C is the saw holder, to the front end of which the saw is firmly bolted. Holder C is connected by means of rods and levers, D E F G, with a movable bed plate, H, one end of which, at H′, is pivoted to the frame of the machine, so that if the bed plate, H, is moved, the saw and all its appurtenances are also moved. The office of rods and levers, D E F G, is to do away with a gate, and yet to hold the saw firm, and cause it always to vibrate horizontally. For this purpose one end of rod, D, is furnished with a slide, which traverses a slot, I, in bed plate, H.

The saw is fed up against the tree by moving the bed plate, H, and this is done by means of a spiral spring, J, which connects with a pulley, K, and a strap, L, extending from bed plate, H, and winding on pulley, K. The tendency of the spring is to pull the bed plate, H, over towards pulley K, and the saw is thus constantly pressed or fed up against the tree.

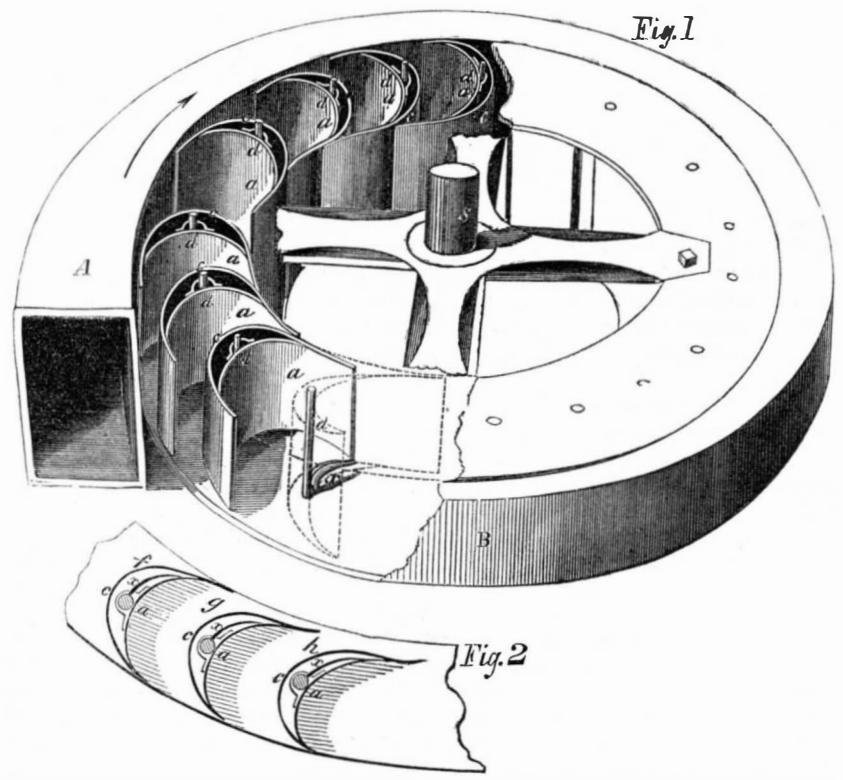
M is a lever for increasing or releasing the tenacity of spring J. The lower end of the lever is connected with the spring; the upper end is provided with a rack, N, the teeth of which catch in a pin on the frame, and hold the lever in any desired position. O are movable legs, which may be adjusted and secured in any position by the set screws, P, so as to readily accommodate the machine to any unevenness of ground. The front end of the apparatus is secured to the tree by means of a dog and staple at Q. When the saw has cut far enough into the tree a wedge is driven into the cut, which prevents the tree from leaning over and binding on the saw.

This improvement, by its extreme portability, simplicity, and strength is calculated to render important aid in cutting down trees. It cuts close to the ground, thus saving wood, may be adjusted so as to cut at almost any angle, leaves the butt ready for the mill, does

MACHINE FOR CUTTING DOWN TREES.

its work with great rapidity, runs easy, cannot well get out of order. We are informed that its total weight is only 150 lbs., so that it may be transported and moved about, in all localities, with much facility. The expense of manufacture is quite small. Invented by S. Ingersoll, of the Farmer's and Mechanic's Manufacturing Co., Green Point, N. Y., opposite New York City, where further information can be obtained. Patent applied for.

IMPROVED CENTER VENT WATER WHEEL.



Improved Water Wheel.

Our engraving illustrates an improvement in Water Wheels, invented by Mr. E. G. Cushing, of Dryden, Tompkins Co., N. Y., for which application has been made for a patent.

A A is the scroll, with part of the top detached. B is the shell of the wheel partly removed to show the buckets. *a* are the buckets having the form of an epicycloidal curve to the radial line, and continued from thence in the circle corresponding with the inner diameter of the wheel to the end. *c* are backs either cast wholly with the buckets, or put on with separate pieces of metal. *d* are bolts made of round iron upon which the buckets vibrate. These bolts are turned with shoulders and secured by nuts on the top and bottom of the wheel. In fig. 2, *f*, shows the position of the buckets when there is but little water let into the scroll. *g* shows the position of the buckets when working at the maximum power with a full gate, and *h* their position when emptied of water. *x* are springs secured to the bottom rim of the wheel, to throw the buckets together when the water is shut off as at *h*. S the shaft.

The wheel is horizontal with perpendicular shaft, and is direct acting. The great superiority of this wheel over all others of its class, it is alleged, consists in making a double bucket with the back of such a curve that the space between the buckets will be of a regular contraction from the entrance to the discharging apertures. It also combines to make the bucket stronger and more durable, and also to obviate the necessity of having the bolts, with which the wheel is fastened together, from coming in contact with the water, thus leaving it entirely free from all obstacles or impediments, which tend to obstruct and break the fluid vein, and thereby divert it from its most efficient course.

Another important feature consists in contracting the fluid vein from the time of its entrance into the wheel until its discharge, thereby causing a uniform pressure throughout the wheel, and also divesting it of any chance whatever of becoming incommoded with dead or slack water between the buckets, as well as to deprive the wheel entirely of air from the first entrance of the water.

The next arrangement consists in hanging the buckets between the rims in such a manner that the inside portion of them has an advantage of leverage, so that the water, in seeking a discharge, will at once open them sufficiently to dispose of the water let into the scroll and according to the amount of power required of the wheel. Also, in the event of any solid substances entering the scroll, instead of the buckets coming rigidly in contact with it, and smashing them out, they will yield instantly to it, and pass by without damage. The springs, *x*, are arranged so that when the gate is shut, they instantly close together on the inner diameter, which causes the water to act immediately upon the wheel, as soon as it comes in contact therewith. The chief value of this invention consists in using a small quantity of water with the same per cent. of power as with a full gate, a desideratum never before obtained, it is alleged, by any other horizontal water wheel.

Poisoning with Strychnine Cured

The Rochester (N. Y.) *Democrat* of the 15th inst. gives an account of a case of poisoning with strychnine which was cured by emetics and chloroform. Josiah Montgomery, one of the Police of that city, took four grains of strychnine by mistake; as soon as he discovered this, he ran to Dr. Swinburne, who administered an emetic, and shortly afterwards a second one. These failed to operate, when a Dr. Bly was sent for, and found the patient convulsed with spasms, and the jaws firmly locked. Chloroform was then administered by inhalation, which had the effect of relieving the spasms in three minutes, and stopping them entirely in twenty. Another powerful emetic was then given, and the chloroform administered at intervals, as it was found that when its effects wore off the spasms returned. In about ten minutes after the third emetic was given; it began to operate, and by the use of warm water drinks the stomach was soon cleansed. The patient, however, was kept under the influence of chloroform for eight hours, at which time the spasms ceased entirely and he ultimately recovered. This is a remarkable case of recovery from the effects of such a dose of this terrible poison—one grain of which will produce death.

SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the Scientific American will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

For the largest List,	$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st of January, 1857.

☞ See Prospectus on last page.

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Scientific American.

NEW-YORK, SEPTEMBER 27, 1856.

The Inventor of Purifying Molten Crude Iron Without Fuel an American.

In the two preceding numbers of the SCIENTIFIC AMERICAN we have described and commented on the process claimed by H. Bessemer, of London, for rendering crude pig iron malleable without fuel—using only a blast of cold air in a close chamber to make the molten pig metal purify itself. We have good reasons for believing that this discovery is not Bessemer's, but J. G. Martien's, one of our own countrymen, formerly of Newark, N. J., who is a practical metal-worker, and who has been residing for some two years in Europe, engaged in introducing new improvements in the manufacture of malleable iron direct from the ore. He informs us that he worked the invention in the presence of a number of witnesses, long prior to the date of Bessemer's provisional specification; one of these witnesses—John Christopher, of Newark, N. J.,—now resides in Pittsburgh, Pa. He operated upon 2000 pounds of crude molten iron in a chamber constructed like the one described by us two weeks ago, and tapped it off in six minutes after it was let in. The result was a refined carburet of iron, some of which was very malleable. The process was exactly the same as that described and claimed by Mr. Bessemer. He told his patent attorney in London of this, and requested him to include the discovery in his application for a patent. The principle he claimed was "the application of air in a natural or heated state under pressure, to fluid iron, from a blast or melting furnace, and in such a manner as to penetrate and *search* every part thereof, not confining himself to the kind of receiver in which the operation may be performed."

His attorney in London did not describe the invention in the manner desired by Mr. M., but the reason why he could not then divine. It now appears that this attorney is greatly interested in Mr. Bessemer's success, and hence the reason for not strictly complying with Mr. M's. wishes becomes evident.

Mr. Martien obtained his patent in England Sept. 5th, 1855, for improving the manufacture of iron and steel, "consisting of the application of atmospheric air by mechanical pressure, or steam for the better purification of the liquid metal below the surface of the said metal as it comes from the smelting furnace, or refinery, the air and steam to be applied separately or together, as may be desired, and in such manner as to completely penetrate and search every part of the said metal as it comes, or after it has flowed from a blast or smelting furnace, and prior to the congelation of the melted metal." This is an extract from his provisional specification, and it embraces the same process as that claimed by Mr. Bessemer, whose patent in England bears date 7th December, 1855—three months after Martien's was issued. This proves conclusively who is the original inventor.

Some persons may attribute these remarks to prejudice in favor of an American citizen, but we ask them to look at the dates of these patents; and if they go to the legal documents themselves, as we have done, they will become convinced that Mr. Martien's process is the same as that claimed by Mr. Bessemer, and that the former is the first inventor. We hope that all the attempts made to deprive him of the benefits of his invention in England and elsewhere will end in failure.

Long articles have appeared in quite a number of the English newspapers flattering Mr. Bessemer highly, and praising his discovery. From the tone of these, and the peculiar sameness of ideas contained in them, it is evident to us that he far surpasses Mr. Martien, our countryman, in his knowledge of the properties of the *hot and cold blast*, in its application to the British Press.

Mr. Martien is supported in his claims by some powerful English iron manufacturers, and they will be pressed and secured in the United States at a proper time, the papers having been lodged by us for that purpose some time since in the Patent Office.

In the last number of the London *Mechanic's Magazine*, August 30th, received by us, C. Sanderson, of Sheffield, Eng., an old and experienced practical metallurgist, while he admits that the decarbonizing of pig metal without fuel is an improvement, he positively asserts that iron so manufactured will not admit of being drawn under a hammer, or rolled into a bar. He also asserts that the steel so made is not cast-steel; that it cannot be made into a boring tool, or fashioned under the workman's hammer.

In our next number we will illustrate the invention, and present some other interesting information concerning this alleged wonderful discovery.

Resignation of the Commissioner of Patents.

Hon. Chas. Mason, who has so long and faithfully presided over the Patent Office as Commissioner, has, we regret to state, sent to the President his resignation. The Executive, we understand, is reluctant to accept it, and up to the time of our going to press had not done so, and we hope will persist in declining, until Mr. Mason shall be induced to withdraw his petition. It would be a calamity to our inventors to have Judge Mason withdraw from the post of Commissioner, and we trust the causes, whatever they may be, which have induced this step on his part, may be removed, and that he may continue in the Office at least through the present administration.

The causes which have led to this sudden step, on the part of Mr. Mason, have not been made public, but if rumor is correct, it is attributable to the unjustifiable interference of the Secretary of the Interior with the duties of the Commissioner.

The appointment of Mr. Mason was universally regarded as an excellent one, and events have fully justified that opinion. Under his admirable guidance, the Patent Office has risen to a prosperity and efficiency never known before.

The Scientific American Prizes.

We continue to receive from every quarter the most gratifying evidences of the popularity of the SCIENTIFIC AMERICAN. From the long lists of subscribers that we are daily receiving, it would almost seem that the enthusiasm, in some localities, for our paper, has thrown all forms of political excitement into the shade. Our liberal offer of $1000 in cash prizes, to those who would exert themselves to make up clubs of subscribers to the SCIENTIFIC AMERICAN, is having its due effect. An honorable competition has sprung up, and the results thus far are highly satisfactory. Some towns which gave us last year large numbers of adherents, have already doubled their former strength.

It may be interesting to those who are engaged, or propose to engage, in the noble strife, to be posted up as to who were the successful competitors last year, and how large their rolls of subscribers were. We accordingly subjoin the list as given by us in January, 1856.

LIST OF COMPETITORS FOR THE SCIENTIFIC AMERICAN PRIZES, JANUARY, 1856, SHOWING THE AMOUNT PAID TO EACH, AND THE NUMBER OF SUBSCRIBERS ON THEIR RESPECTIVE LISTS.

No.	*Name.*	*Residence.*	*Prize.*	*List*
I.	J. CANT,	Hamilton, C.W.	$100	172
II.	M. M. GREEN,	Louisville, Ky.	$75	132
III.	J.F. LONECRAFT,	Rochester, N. Y.	$65	94
IV.	W. C. GRANT,	Detroit, Mich.	$55	82
V.	J. L. MITCHELL,	Jackson, Mich.	$50	75
VI.	J. L. DICKINSON,	Dubuque, Iowa.	$45	71
VII.	G. C. HYATT,	Adrian, Mich.	$40	66
VIII.	J. S. BARBER,	Waukegan, Ill.	$35	61
IX.	JNO. GARST,	Dayton, Ohio.	$30	55
X.	H. S. BABBITT,	Newark, Ohio.	$25	46
XI.	C. BIERSTADT,	So' Dedham, Mass.	$20	45
XII.	L. LYMAN,	Quincy, Ill.	$15	45
XIII.	B. RANKIN,	Louisville, Ky.	$10	45
XIV.	R. SKINNER,	Princeton, Ind.	$5	45

It will be observed that some of the competitors sent the same number of subscribers. In these cases the amounts of the prizes their due, were, by consent, equally divided.

Our friends should bear in mind that the sum total of the prizes last year was only $450, while this year it is increased to $1000. To one and all we say, work hard! Let the list of honor, to be published in January, 1857, show a great increase of effort over 1856.

Franklin.

The good people of Boston have erected a statue to Franklin, who is acknowledged to have been one of the greatest philosophers that ever lived; the inauguration took place on the 17th inst.—Franklin's birthday. There was a very large procession on the occasion, and a highly appropriate one in many respects. There were exhibited a new and beautiful locomotive and tender named Benjamin Franklin, mounted on trucks, and drawn by eighteen horses; the House and Morse telegraph instruments; the electric fire-alarm; Franklin's old printing press, on which was struck off and scattered to the crowd a *fac similie* of his newspaper, dated 1723; immense structures on wheels, representing school-rooms, filled with scholars at the desks; and a vast number of other novel and interesting features, made up one of the grandest displays ever witnessed. The Mechanics' Charitable Association, and numerous other charitable societies of Boston, and mechanics and other societies from the adjoining cities and towns were out in full force. Also, the Franklin Medal Scholars, children of the public schools, &c.

Franklin took a deep interest in the education of the people of his native city, and left one hundred pounds to be invested, and the interest applied to purchasing silver medals—Franklin Medals—as honorary annual rewards for the encouragement of scholarship in the free schools. Who can estimate the amount of good these have accomplished in stimulating the genius of Boston youth?

Franklin was a noble representative of the American mechanic, inventor, and philosopher. He invented a number of improvements in the printing press; he invented the stoves which still bear his name; and made one of the most important discoveries in electricity—he proved its identity with lightning. From his youth to the closing years of his eventful life he thirsted after knowledge, and he lost no opportunity of acquiring it. He was 40 years of age before he saw a single electrical experiment performed—this was while on a visit to Boston in 1746, by Dr. Spence, who had recently arrived from Scotland—and soon afterwards he distanced all others by new discoveries in this science. He had a most happy tact in planning experiments and conducting them. He was distinguished for great *common sense*—not such a common commodity, but we know well what it means, namely, a sound judgment, great powers of observation and reflection. He was of a very cheerful temper, and loved his business, in which he was diligent, and stood before kings, the greatest of them all. His life presents a strong example to our mechanics for imitation.—Franklin left no male descendants to perpetuate his name; but on his grandson, Prof. Bache, has fallen his scientific mantle.

The statue is a beautiful bronze casting, above the life size, designed by R. S. Greenough, of Boston, and cast at Ames' celebrated works at Chicopee. It stands upon a pedestal of verde antique marble, set upon a base of granite. It represents Franklin standing in an easy attitude, with a cane in his right hand, and his old-fashioned cocked hat under his left arm, and is stated to be an admirable likeness of the mechanic philosopher.

Our Great Ships.

The *Great Republic*, the largest ship ever built in our country for the commercial marine, by Donald McKay, of Boston, was burned to the water's edge during a great fire in this city in the winter of 1853, when loaded and ready for sea on her first trip. Her hull was saved, however, and sold by auction; she was rigged anew, and sent to Europe, where she was employed by the French Government as a store-ship during the Crimean war, in which service she surpassed all others for her sailing qualities and great capacity, having carried 3000 soldiers and 400 horses, during one trip, besides heavy cannon and ammunition. Having completed her engagements with the French Government, she arrived at this port, last week, and was the object of much attention.

On the 15th inst., a new and magnificent Liverpool packet-ship, the *Ocean Monarch*, was successfully launched from the foot of Tenth street, East River, in the presence of an assemblage of 5000 persons. Her length is 240 feet on deck; breadth 46 feet depth of hold 30 feet. She can carry 7,000 bales of cotton. Her frame is of live and white oak, and she is bound from stem to stern with angle-crossed iron straps four and a-half by 3-4 inches. She is not only the largest but the strongest merchant ship ever built in New York. A great change has taken place in the form and character of our merchant ships during the past six years. In appearance, they are entirely different from the old ships: they are larger, sharper, and more graceful in their proportions.

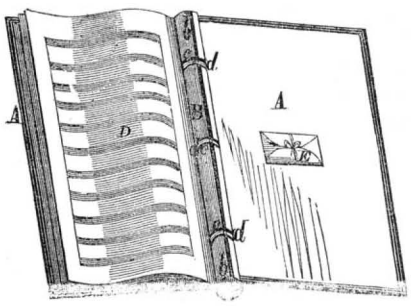
Recent American Patents.

Novel Sewing Machine.—By C. R. Gardner Detroit, Mich.—This is the cheapest and most compact contrivance of the sort that we have seen. It throws all of the cheap sewing machines that we hear of, in these latter days, into the shade. This new comer is not much larger than a pair of scissors, can be made for a dollar or so, and the inventor thinks, will compete, in quality of work, with many of the best machines now in use. Ere long we hope to present an engraving of the bantling.

Shaft Shifter for Sleighs.—By George Kenny, of Milford, N. H.—This is a contrivance connected with the forward part of sleighs, for the purpose of shifting the shafts or thills, so as to bring the horse directly in front of the vehicle, or on one side, at pleasure. It consists of a couple of small spring catches and a rod, the arrangement being such as to permit a convenient change either way, as desired. Mr. Kenny is the inventor of a number of excellent improvements relating to vehicles.

Paper Cutter.—By Hervey Law, of New York City.—This improvement is intended to assist bookbinders and others in cutting the edges of books and masses of paper. It consists of a novel combination of parts, whereby the power which operates the knife also clamps and feeds the paper. Heretofore it has been necessary to operate the clamping device separately. The invention is in use at Messrs. Harper's establishment in this city, and is said to work well.

Improved Portfolio.—By James Shaw, of Providence, R. I.—In this portfolio sheets of music, letter sheets, newspapers, engravings, manuscripts, and other papers may be successively inserted, and as substantially secured as if bound in the usual manner.



A are the covers of the Portfolio, constructed in the usual manner; B is a roller of wood; this roller is permanently attached to the back of the portfolio. Roller B has a longitudinal groove, *b*, cut in its entire length, also grooves, *c*, cut in it circumferentially. In the grooves, *c*, metallic rings, *d*, are fitted; these rings are not fitted tightly in the grooves, *c*, that is, the grooves on the exposed side of the roller are wider and deeper than the thickness of the rings, so that threads may be passed around the rings; at the back or unseen point of the roller the rings are fitted tightly in the grooves, *c*, and are attached to the roller so that they cannot turn therein.

The music sheets and other articles designated by D are secured within the portfolio by sewing them to the metal rings, *d*. A needle which is slightly curved, carrying the thread, is passed under the rings, *d*, through the longitudinal groove, *b*. then through the sheets, so as to secure the sheets to the several rings. Single sheets are inserted by folding a narrow strip on the inner edge, and then securing them the same as double sheets. E is a pocket attached to the cover, in which the needle and thread may conveniently be kept.

An important feature of this portfolio is, that in its action it is superior to the spring

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back bound book when filled or partially filled with sheets, and placed in nearly an upright position (upon the rack of a piano for instance) there is no disposition in the leaves to turn over of themselves, as is the case with books bound in the usual manner, particularly when newly bound. Contrivances for keeping the book open may, therefore, be dispensed with.

This portfolio is simple in construction, and the roller back with the rings complete, and in readiness to attach to the covers, is of small cost. The expense of the article complete will depend upon the style and finish of the cover. Address the inventor as above for further information. Patented June 11, 1856.

New Printing Press.—By A. Newbury and B. Newbury, of Windham Center, N. Y.—Consists in the employment of a rotating and reciprocating printing cylinder, and also in a peculiar inking device, and fly, which catches the sheets as they issue from the press. The machine is extremely simple, and it is believed, will work rapidly and well. It may be constructed at a small cost, and is not liable to get out of repair.

Machine for Heading Bolts.—By E. Coleman and P. Coleman, of Philadelphia, Pa.—Consists of a rotating device attached to the bolt machine, whereby the bolt is turned intermittently within the jaws during the process of heading. The usual burr which is now formed on bolts below the heads is thus avoided.

Shingle Machine.—By John Broughton, of Chicago, Ill.—Consists of a disk wheel with knives, face guide, and cam attached, and used in connection with a vibrating bed. This machine is designed for cutting shingles from blocks that have been previously steamed. It is very simple, both in construction and operation. The only parts requiring any adjustment are the face guide, to give the thickness of the shingle, and the face cam, to give the taper.

Saw Set.—By A. Casey, New York City.—The main object of this invention is to save the saw blade from being strained or bent and rendered untrue, by the operation of setting the teeth to cut a broader kerf. The arrangement could not be easily explained without drawings.

Improvement in Steam Engines.—By Charles H. Reynolds, of Lewiston, Me.—This invention is applicable directly to the induction valves of a steam engine, when separate induction and eduction valves are used for each end of the cylinder; or to a separate cut-off valve arranged in the induction pipe, to act independently of the valve or valves which regulate the induction and eduction of the steam. It consists in a novel arrangement of mechanism connecting the valves with the governor, for the purpose of varying the closing movement of the valves, and thus to regulate the engine.

The Plow.—An Improvement Wanted.

"In our volumes of last year, under the above heading, will be found an article in which we called attention to a defect in the action of plows, a remedy or preventive of which would certainly be a great improvement. The defect to which the attention of our readers was called in that article, seems the *necessary* result of the present form and mode of action of the plow, which is, in reality, a *wedge*, forcibly dragged through the soil, lifting up that portion which is above it, at the expense of hardening or making more compact that portion which is below it. This mode of action has a tendency to harden and glaze over the subsoil, or that part of the soil on which the sole of the plow rests in its passage, and is productive of several injurious effects; as, for example: 1. It makes a compact surface very hard to break through or get under in subsequent plowings. 2. It makes the lower surface so dense that the roots of plants must often find it impossible, or very difficult to penetrate it; and 3. It forms a groove in which surface-water must sometimes be retained long enough to injure the growing crops.

The above is the defect which it is desirable to get rid of. The improvement wanted is some contrivance by which this defect could be prevented or remedied. Nothing of the kind has been as yet proposed, so far as we can remember, by any of our ingenious countrymen. The following proposal was lately made at an agricultural meeting in Great Britain. The object, let it be remembered, is to preserve the bottom of the furrow in a pervious condition, and to get rid of that compactness, which, in addition to the evils already named, must be a great obstacle to the perfect drainage of a clay soil. The remedy proposed consisted in the adaptation of rollers to the sole shoe, or in adding a hind wheel, notched or teethed, so that when following in the track of the sole shoe the notches or teeth may break up the smooth track formed by its action. The proposer of these two modes of improving the plow seems to think most favorably of the idea of rollers—whose mode of action, however, he does not specify—as they would not only prevent the glazing and hardening, but would, in his opinion, lessen the draft.

We submit these suggestions to our ingenious inventors and mechanics, and to our agricultural brethren of a mechanical genius, in the hope that they may prove a germ of a much-needed discovery or invention."

[We copy the above from the *Albany Cultivator*, which is one of the most practical and reliable agricultural papers in the country. The subject is one of importance. We have no doubt that inventors will respond to the call made upon them in the proper manner. The invention of a plow that will meet the requisites above described, would be a lasting benefit to the agricultural world, and bring a large fortune to the patentee. Come forward inventors, and help the farmers to a new plow.

Prevention of Smoke.

In all our Atlantic cities and villages where wood and anthracite coal are used for fuel, no smoke fills the atmosphere, and the houses have that clean and fresh appearance which excites the surprise of persons arriving here from England, where bituminous coal is employed for fuel. In various parts of our country, however, bituminous coal is now used for fuel, and it will yet become the great fuel for manufacturing and domestic purposes, owing to the magnitude of our bituminous coal fields, in comparison with which the anthracite beds are mere specks. Where bituminous coal is used (as in Pittsburg, and the cities and villages on the Ohio river) the atmosphere is redolent with smoke, and the houses have a sooty, chimney-sweep appearance. If the smoke from such fuel could be prevented, it would be a very desirable thing to all those who use it. Two inquiries, therefore, arise in regard to it, namely: what is the cause of the smoke; and can it be prevented.

Fairbairn, C. E. and M. E., of Manchester, Eng., in his lectures to engineers, presents some very useful information relating to these two questions. He says:—

"Perfect combustion is the prevention of smoke, and whenever smoke makes its appearance we may reasonably infer that there is imperfect combustion, and probably the want of attention to a few simple rules is the cause. From well-known chemical facts, 1 atom of coal gas requires 8 atoms of atmospheric air for its complete combustion; when that quantity is at its maximum, or in excess, there is no smoke; when this condition is not fulfilled, smoke is invariably present. In order to render the residue of the products of combustion transparent or smokeless, a supply of air, amounting to fifteen times that of the gases evolved, must be admitted. Should it exceed that quantity, the effect will not be smoke, but an additional expenditure of fuel to supply the loss of heat which this excess of air would require for absorption, rarefaction, &c. Hence the necessity which exists for power to regulate the admission, if not the exact, at least of an approximate quantity of air. On the other hand, should the supply be deficient in quantity (which is often the case) a dense volume of smoke is then visible, accompanied with all the defects and annoyances of imperfect combustion.

The variable changes which accompany perfect and imperfect combustion are not only visible, but may be proved by experiment.—Let any person apply his hand to the tube of an Argand gas-burner, and he will find that the instant the aperture is partially closed, the flame immediately becomes elongated, and instead of a clear brilliant light, a dull red flame with a dark volume of smoke, is the result. This shows the effect of a diminished supply of air; and the same may be applied to a steam engine furnace when imperfectly supplied with oxygen, when the gases pass off in opake volumes unconsumed, and where a considerable portion of heat is entirely lost from that cause. It has been stated that we cannot have fire without smoke, but this is not the case in steam boilers, as a well-constructed furnace, properly managed, furnishes many examples where bituminous coal is consumed in large quantities, and with little, if any, appearance of smoke. In attempting the total suppression of this nuisance two important considerations require to be attended to as essential, the first of which is, an abundance of boiler space, and the second a sufficient supply of air."

The reason why wood emits but little smoke is that it contains within itself a great amount of oxygen, to produce perfect combustion.—The reason why anthracite coal emits no smoke is that it contains no hydrogen, like bituminous coal; it is mostly composed of carbon, which is not volatile, and only becomes so when it unites with its combining proportions (C. O^2) of oxygen in perfect combustion, producing carbonic acid gas. Bituminous coal is a hydro-carbon, that is, it contains hydrogen, a very volatile gas, which at a comparatively moderate heat escapes, and lifts up some of the carbon with it, thus producing carbonic oxyd (smoke). The addition of more oxygen to it at a high heat will produce perfect combustion, prevent smoke, and increase the quantity of heat. The prevention of smoke, therefore, not only involves the removal of a disagreeable evil, but the saving of fuel also.

Great Exhibition of the American Institute at the Crystal Palace, New York.

The Exhibition opened agreeable to announcement, on the 22nd inst., but at the time of our going to press had not assumed a very orderly appearance. Indeed, the Palace was by no means in readiness for the public. A few days, however, will suffice to work a marvellous change in the face of things. The Exhibition will then become interesting, and spectators will begin to flock in by thousands.

The indications are, that the Fair this year will surpass those of previous years. The display of working machinery promises to be very large. The arrangements for motive power are on the amplest scale.

Among the mechanical novelties already on hand is a splendid steam fire engine from the Island Works, Seneca Falls, N. Y., and an air engine from the Neptune Works, of this city. We shall describe them at another time.

Next week we shall commence our more formal reports, and devote considerable space each week, during the continuance of the Exhibition, to descriptions of the principal novelties in each department.

Thrashing by Steam Power.

E. S. Judd, of Stevens' Point, Wisconsin, informs us, that last spring he and his brother, H. A. Judd, purchased a four-horse power steam engine, of Hoard & Son, of Watertown, N. Y., which they have applied with much success to thrashing grain. They first tried it with a common thrasher and separator, usually driven by four horses, but finding it more powerful than they expected, they applied it to an eight-horse thrasher, which it worked with ease to the astonishment of those who first witnessed it, and who were so well pleased with its performance that they threw up their hats, and gave three cheers for steam. He informs us that competent judges assert, that their four-horse steam engine drives the thrasher and separator with greater ease than eight horses. The farmers all like it, as it is twelve per cent. cheaper than horse power for thrashing. It is mounted on wheels; the farmers furnish them with wood and water, and they go from place to place thrashing by steam. This portable steam thrasher is a great acquisition to agriculture, and he thinks that the farmers of Illinois should devote their attention to steam thrashing as well as steam plowing. With a four horse thrasher, they have thrashed 100 bushels of wheat per hour.

A Marine Locomotive.

Mr. William Lonsdell, a machinist of Memphis, Tenn., has invented what he terms a Marine Locomotive, and which is designed to be substituted for the present steam water craft, by making the base of the boat the propelling agent, instead of paddle wheels, as now used. The invention consists in using two huge parallel hollow screws in the place of the present keel, and revolving them by means of steam power, so that they will cut their way through the water as a common screw cuts into wood. The screws are constructed of iron, and, as before stated, are hollow, but are divided into compartments, as precaution against sinking, in case of an accident.—[Washington Star.

[The idea of this locomotive is obtained from that of H. A. Frost, illustrated on page 180, Vol. 9, Scientific American. The difference between the two is, that Frost's has only one revolving hollow screw, and contains the cabins in its interior.

Geographical Expeditions.

Exploring expeditions have become quite a mania at present. One is about to be fitted out by the Pacha of Egypt to explore the upper sources of the Nile, and another projected by some Englishmen with the same object in view, but taking a different route. The Nile is still a mystic river, and we know but little more about the countries through which it flows than that left us by the traveler Bruce, nearly a century ago.

Prof. Burmeister—the celebrated botanist—of Halle University, in Germany, is about to proceed on an exploring expedition up the La Platta region in South America.

An expedition is talked of in this city, for the purpose of exploring the mountainous regions behind the Colony of Liberia, in Africa. There is much of this world respecting which we are yet completely ignorant. We hope these expeditions will remove the clouds and shadows which still hover o'er those regions which they contemplate exploring.

Uses of Cypress Bark.

We have received from C. K. Marshall, Esq., of Vicksburg, Miss., a small package of the inner bark of the cypress tree, with a description of its uses, and he directs our attention to other purposes to which it may be applied.

This bark is very fibrous, of a dark tan color, and thousands of tuns of it can be furnished at the southern saw mills every year. He believes, and, we think, justly, that it would make excellent wrapping paper. It is employed in small quantities by some boatmen for caulking boats, and it possesses the quality of repelling the attacks of all water worms. It makes very good rope, and some of the raftsmen twist its fibers, and use it for this purpose. If any paper manufacturer desires to make some experiments with it, or any of our ship caulkers for caulking the seams of vessels, he will willingly furnish them with specimens.

We are convinced that the inner bark of the cypress tree—which is the common growth of the low lands in the South—might be used as a cheap material for making mats, coarse ropes, and a hundred other things. The natural resources of our country are not half developed. We send abroad for cocoa fiber for making coarse mats and rugs, while we have a superior article, thousands of tuns of which is annually thrown away at all our southern saw mills.

Death of a Celebrated Navigator.

Sir John Ross, the celebrated Arctic navigator, recently died in Scotland at the advanced age of 80 years. His expedition to the Arctic regions, ending in 1833, lasted four years, and he sailed over the exact northern pole of our globe: indicated by the compass whirling round on its pivot.

The U. S. propeller *Arctic*, which was dispatched by our Government to sound the ocean track for the telegraph cable between Newfoundland and Ireland, has arrived at the latter country, but no report of her ocean survey has yet been made public.

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T. S., of Mass.—The heat of the steam, is also a test of its pressure, and thermometric instruments are now employed on boilers to indicate its temperature. These are auxiliaries to pressure gauges.

T. D. J., of Mich.—Flexible Life Preservers, having two and three apartments, have been used. We witnessed experiments with such eight years since. Their principle of construction is correct.

M. J. H., of N. Y.—A full published description of an invention would prevent it being granted in a foreign country, or null, in the eyes of the law, if obtained. Your plan of naval warfare appears feasible and terribly effective, at short fighting distances. We would advise you to lay it before the Secretary of the Navy.

S. C., of ——.—The phenomenon of the earth forming part of the telegraphic circuit, is still involved in obscurity. We have little confidence In any of the theories advanced on the subject. We want more light on the subject, and for this purpose experiment, and not speculation, is what is wanted.

A., of La.—We do not think your method of setting saw teeth is patentable. If you examine our reports of the American Institute Fair published in October and November, last year, you will find a description of a saw that planes as you propose. A method of filing and setting circular saws is described on page 259, Vol. 8, Sci. Am. The saw must be set according to the kind of wood it has to cut. With a little practice you will find out the proper angle for filing. If you run it with a high velocity, and keep the teeth sufficiently wide apart you will not be troubled with saw dust in the cut,

A, J. B., of Mass.—You cannot prevent the formation of crust in culinary vessels, if you use hard water. The best way to remove the incrustations is to heat the vessels when dry, and then strike them with a stick on the outside; this will crack off the crust. You must not use acid, in tin-ware vessels, to eat the crust.

A. B. H., of Ind.—The sulphate of lead is formed by double decomposition with any salt of lead. Pour strong sulphuric acid upon sugar of lead, then wash it with water to remove the free acid; the powder is the sulphate—which you want and cannot obtain in your city. as you have stated.

G. F. W., of Mass.—The articles on metallic springs will be very useful information.

D. W., of Ind.—Reed's work on clock and watch making is the only one we know of devoted to that subject.

Thomas Place, Alfred Center, N. Y., wishes to correspond with some manufacturer of hand-boring machines. We cannot furnish all the numbers of Vol. 9, first half.

H. D. S., of Geo.—You can purchase a good barometer of E. & E. W. Blunt, 179 Water street, N. Y. Write to Prof. Henry, of Washington, respecting the instruments you have mentioned. The anemometer is described in every good work on pneumatics.

E. B. W., of N. Y.—A candle gives as much light during day as at night. Its intensity of light depends entirely on the amount of oxygen it consumes in a given time.

J G. P., of Ohio—Tell P, R. to get Hodge's work on the steam engine: price $10; also Bourne's Catechism, price $1, published by Appleton & Co,, this city. These will give him the information he wants.

J. S., of Baltimore—There are various patents on turbine water wheels; Address Uriah A. Boyden, Lowell, Mass., for the information you desire.

L. O., of N. Y.—Dr. Muspratt's work on Chemistry, now publishing, by C. B. Russel & Bros., Tremont street, Boston, will be the best for your purpose ever published; it has not yet reached the article "Gums;" you must consult Ure's Dictionary on this subject.

E. S. J., of Wis.—Your marble saws are similar to the first models which passed through our office, and are therefore not patentable.

H. B. N., of Ohio—From the weed you have sent us, good paper, no doubt can be manufactured, but not so cheap as from rags.

H. P. T., of Mass.—There is no work on well sinking and boring published in our country; but there is one on Road Making—Prof. Gillespie's. You can obtain it at the book stores.

R. H. K., of Ohio—We are not acquainted with the book mentioned; inquire at the book stores; they keep catalogues.

T. V. P., of Ohio—The engine sketched and described in your letter, is just a rude hot-air engine; it is of no practical utility.

S. & B., of Conn.—The pencil to which you refer would not be patentable, according to the description you have given of it.

C. W. D., of Vt.—Bourne's Catechism of the Steam Engine, published by Appleton & Co., this city, contains the information you want relating to setting valves.

H. P., of Conn.—Your explanation of the motions of the rotoscope is the same as that of rotary motion, and, is correct.

Money received at the Scientific American Office, on account of Patent Office business for the week ending Saturday, Sept. 20, 1856:—

J. B. D., of Tenn., $15; G. H. T., of Mass., $109; P. M., of Ill., $110; W. H., of Wis., $25; W. S., of Iowa, $25; H. C., of Pa., $25; J. B., of Mich., $25; J. S., of O., $25; A. R., of N. Y., $25; G. D. L., of N. Y., $25; P. & C., of N. Y., $35; S. & S., of N. J., $25; W. W. Jr., of O., $35; O. V. D. R., of Ill., $30; W. M., of Mass., $30; W. & M., of N. Y., $30; W. & J. C., of N. Y., $30; D. A. S., of Conn., $30; J. L. H., of N. Y., $30; D. L. J., of Mich., $30; F. A. H., of S. C., $25; J. S., of L. I., $25; W. H. S., of R. I., $30; C. H. H., of N. H., $25; S. T., of O., $30; A. B. C., of N. Y., $30; E. A. C., of Conn., $25; C. M., of N. Y., $30; H. R. & J. L. P., of Mass., $275; A. F. W., of Ky., $50; J. D. S., of Mass., $55; J. P., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 20th:—

G. H. T., of Mass., (2 cases); I. S., of O.; W. S., of Iowa; H. C., of Pa.; J. B., of Mich.; W. H., of Wis.; F. A. H., of S. C.; J. L. H., of N. Y.; J. K., of L. I.; M. & F., of N. Y.; S. & S., of N. J.; A. McL. & B., of N. Y. A. R., of N. Y.; S. & T., of O.; C. H. H., of N. H.; W. T., of O.; S. T., of O.; E. A. C., of Conn.; P. & C., of N. Y.; J. P., of N. Y.

Important Items.

Models—Inventors, in constructing their models, should bear in mind that they must not exceed a foot in measurement in either direction. They will also remember that the law requires that all models shall be neatly and substantially made of durable material. If made of soft wood they should be painted or stained. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

Patent Laws and Guide to Inventors.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis at this office upon application by mail.

Receipts—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

Foreign Subscribers—Our Canada and Nova Scotia patrons are solicited to compete with our citizents for the valuable prizes offered on the next volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fees for copying.

Binding—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

Infallible Rule—It is an established rule of this office to stop sending the paper when the time for which is was prepaid has expired, and the publishers will not deviate from that standing rule in any instance.

Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

☞ All advertisements must be paid for before inserting.

IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had Ten years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

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In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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BROOKLYN WATER WORKS.—NOTICE TO MACHINISTS.—Sealed Proposals will be received at the office of the undersigned, No. 4 Wall street, New York, until October 1st, 1853, at noon, for the construction of two pumping Engines—Cornish or equal to Cornish, for the Brooklyn Water Works, of capacity to raise ten millions (N. Y.) gallons daily each; 170 feet high, with three boilers each; to be built and erected complete on the stone foundation prepared for them, and to be of first class workmanship.

Drawings in detail, accurately defining the style and character of Engines and appurtenances to be submitted by the proposers, with description. Specifications and further information may be had at the office of the Chief Engineer, James P. Kirkwood, Esq., No. 4 Halsey's Buildings, Brooklyn, or of the undersigned. The right is reserved to reject any of the proposals made.

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N. W. ROBINSON'S PATENT HEAD TURNING AND PLANING MACHINE, for Heads of all kinds and descriptions; it will make from 200 to 350 heads per hour, of the most perfect description. There will be one on exhibition at the Crystal Palace, N. Y., at the Fair of the American Institute, in October, where those wishing for Machines or State rights can see it in operation and judge of its merits for themselves. All communications in relation to machines and rights should be addressed to ROBINSON, SCRIBNER & CO., Keeseville, Essex Co., N. Y. 1 4*

THE PATENT DECISION—To the Editors of the Scientific American:—The statement in your paper of this morning in regard to the verdict of the jury in the case of George Page *vs.* Georgia, is a perverted one. It is true that the verdict was in favor of the defendant, but not upon the ground stated in the Elmira Advertiser, which you copied. On the first ballot of the jury there were 7 for the plaintiff and 5 for the defendant.—The jury then proceeded to take up each question separately: First, they passed upon the question of priority of invention, and decided in favor of plaintiff, George Page. The next question was, Did the defendant infringe the patent? Upon this question the jury stood 8 for plaintiff and 4 for defendant, and so stood until 5 o'clock in the morning, and ultimately brought in a verdict for defendant, upon the testimony of one of the witnesses for defendant, who swore that he had tended the mill from the time it started, and that it never had end-play. And as this formed the essence of the infringment, and it was not proven by the witnesses of complainant that the mill had been worked with end-play, though the fact is notorious that it had been so worked, the jury found for the defendant, though they unanimously decided that the priority of invention belonged to George Page, thereby sustaining the validity of his patent.

GEORGE PAGE & CO.,
Baltimore, August 2d. 50 4*

A NEW AND SCIENTIFIC INVENTION—Dr Cheever's Galvano-Electric Regenerator. Patent issued Jan. 15th, 1856. A circular relating to the use of the instrument, embracing a general treatise of atony of the spermatic organs, the result of which tends to softening the medullary substance of which the brain is composed may be had gratis, and will be sent to any address by mail by their indicating a desire to receive it. All letters should be directed to DR. J. CHEEVER, No. 1 Tremont Temple, Boston 51 4*

ALEXANDER'S COMPOUND Parallel Sawing Machine, for making lath from the slab or board cross-cutting, ripping, and sawing miter, all combined in a cheap, simple and compact manner, is illustrated in No. 50, Scientific American. Sash factories, cabinet shops, carpenter shops, etc., should have these machines. Price $60. Country and State rights for sale. Address THOS. J. ALEXANDER, Westerville, Franklin Co., Ohio. 50 5*

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NO. 2.—INVENTORS, PATENTEES, &c., were all cordially invited to place their models here, free of charge, and the Philadelphia papers say there is already six to eight hundred thousand dollars worth of patents in this room, and visitors from all parts of the world visit there to see them. 51 4*

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CHARLES W. COPELAND,
1 eowtf Consulting Engineer, 64 Broadway.

THE NINTH ANNUAL EXHIBITION OF THE Maryland Institute for the Promotion of the Mechanic Arts will be opened at the Institute's spacious hall, Baltimore, on Wednesday, Oct. 1st, and continue to Oct. 29th, 1856. Goods for exhibition and competition will be received at any time prior to Friday night, Sept. 26th, after which for exhibition only, except such as the Committee shall be satisfied were dispatched in time to have reached the Hall by that day, but failed to do so from unavoidable detention. The co-operation of the manufacturers, mechanics, artists, and the community generally is respectfully solicited. Circulars embodying the regulations and blank applications for space, with all other information, will be promptly furnished by application to John S. Selby, Actuary of the Institute.

JOSHUA VANSANT,
514 Chairman of the Exhibition Committee.

CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects; they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places. the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston.
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KNITTING MACHINES—Circular and straight knitting machines of all sizes and gauges on hand and made to order. WALTER AIKEN, Franklin, N.H. 46 13*

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PAGE'S PATENT CIRCULAR SAW MILLS with Steam Engine and Boiler, on hand and for sale for $1500, at Schenck Machine Depot, 163 Greenwich st. New York. A. L. ACKERMAN. 49 10

CIRCULAR SAW MILLS—The subscriber has on hand, and is constantly manufacturing those celebrated mills, with saws from 30 to 80 inches diameter, adapted to manufacturing most kinds of lumber, and warranted to give satisfaction. For prices, &c., address W. HERRICK, Northampton, Mass. 49 8*

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NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, Office for sale of rights at 27 State street, Boston, and Lowell, Mass, 45 6m*

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 1 tf

HARRISON'S 30 INCH GRAIN MILLS—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn. 31tf

CLOCKS for Churches, Court Houses, &c. Regulators and time pieces for jewelers, railroads, offices, &c. Also glass dials of any size for illuminating, and other kinds manufactured and warranted by the subscriber.—JOHN SHERRY, Oakland Works, Sag Harbor, N. Y.
37 12 eow

BOILER INCRUSTATIONS PREVENTED—A simple and cheap condenser manufactured by Wm. Burdon, 102 Front st., Brooklyn, will take every particles of lime or salt out of the water, rendering it as pure as Croton, before entering the boiler. Persons in want of such machines will please state what the bore and stroke of the engines are, and what kind of water is to be used. 41 tf

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Science and Art.

Gum Copal.

This is a valuable and singular kind of resin, which, according to some authorities, naturally exudes from different large trees found in the East Indies. Dr. Ruschenburger still asserts that it is a gum found about the roots, whence it is dug up in large quantities, and is often obtained from places where the tree had been grown many years before. The best copal is of a bright yellow color, transparent as amber, found in small rounded lumps or flat pieces, hard and brittle, but easily reduced to powder. When dissolved in linseed oil, it forms a beautiful varnish, which, when applied to pictures, snuff-boxes, tea-trays, &c., gives luster to the painting, and brings out the colors Copal is liable to be confounded with gum anime, which exudes from the roots of the locust tree (*Hymenæa Courbaril*).

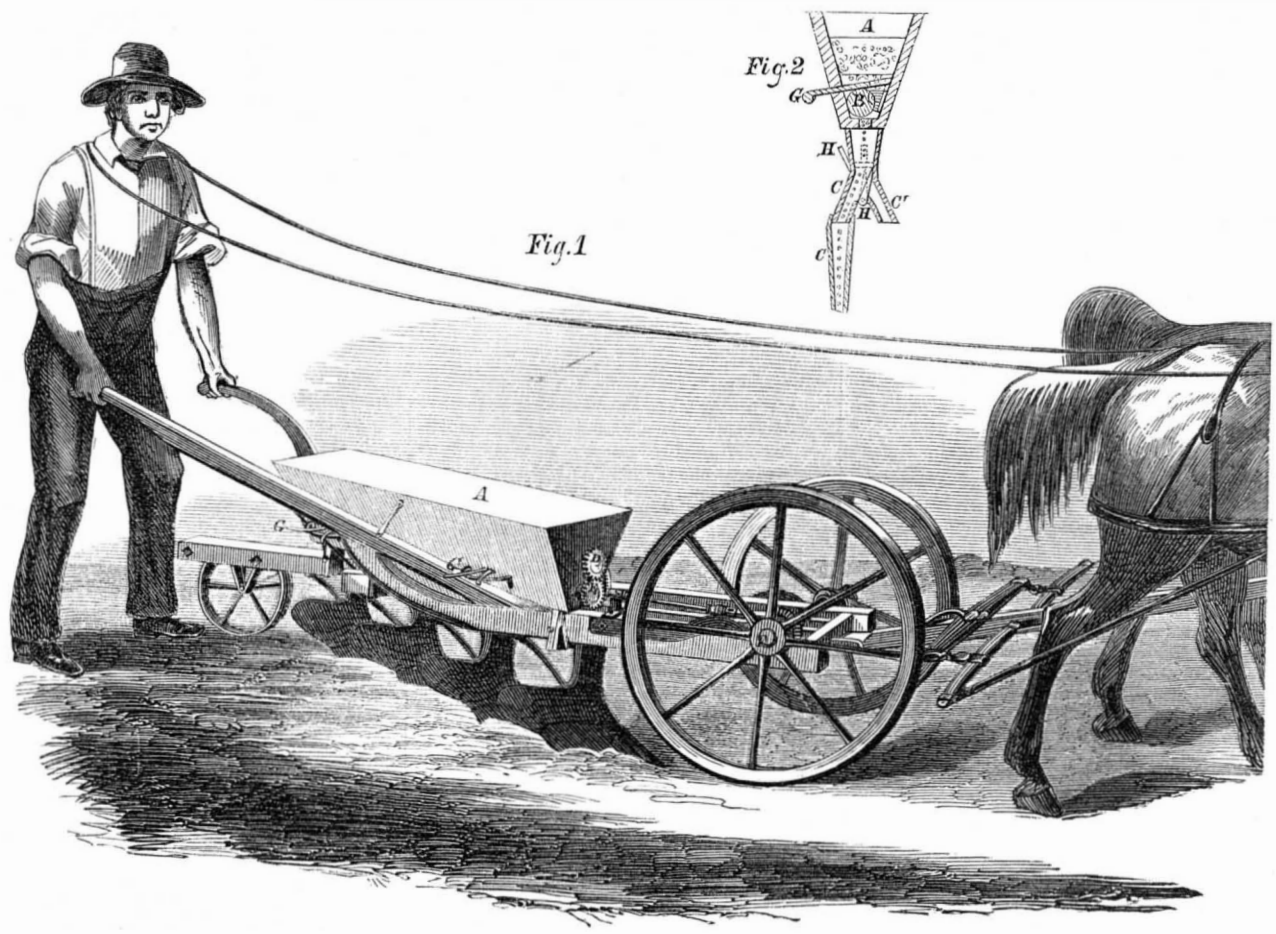
According to M. Landerer there are three varieties of copal, differing from each other in their properties, viz., Brazilian, West Indian, and East Indian or Levantine, copal. The latter variety is sold in the bazaars of Jerusalem, Mecca, and other places, as a species of choice incense, and it plays a very leading part in all the fumigating drugs of the East. The people employed in the collection of the copal in Palestine and Abyssinia dig deep trenches around the tree, and then collect and sort the pieces of gum which fall into them. They are afterwards freed as much as possible of the earth that adheres to them by washing and stirring. African copal is obtained from a species of *Hymenæa*, and from fourteen to seventeen tuns are imported to Liverpool from Sierra Leone. New Zealand copal is the Kauri gum; Brazilian copal is the produce of *Trachylobium Martianum*.

In commerce, copal is distinguished into the hard and soft kinds. The chief varieties of the former are: 1st, copal from Madagascar (in large, flat, yellow pieces), which, when cold, is tasteless and odorless, but when heated, diffuses an aromatic odor; this kind is rather rare. 2d. The East India copal, the most common commercial variety; it is rough on the surface, bearing the impression of sand. The best specimens are colorless, and in small pieces, constituting the copal from Calcutta. A third, but very small variety, is brought from the Brazils and south of Africa. In the Calcutta variety, pieces of all the other kinds are to be found; nor is a distinction readily to be made between the white copal of Calcutta, and the yellow resin of Bombay; the difference appears to depend only on the care bestowed on the selection and purification of the pieces. The various resins, from anime to soft copal, Indian and Madagascar, seem to form a continued series, differing only in the increased quantity of oxygen they contain. A curious variety of copal is that in the pebble form, rounded by the action of the water.

Copal is the Mexican generic name for all resins. In the collection of products from Mexico shown at Paris, there were several resinous gums, of which no particulars, however, were obtainable—one, an unnamed resin, very much like anime; another termed Axin resin, which burns with little flame, and blackens—a whiter kind, called Archipan resin, has much the same properties, and a bitter flavor. A nominal copal from the same quarter resembles very closely the resin of Tacamahaca, being of a white color, with a coniferous smell.

Copal varnish for fine paintings is made by fusing white resin in a clean iron vessel, then pouring into it 2 gallons of clear hot linseed oil to every 8 lbs., boiling it for 15 minutes, then pouring in 3 gallons of turpentine when cooled down. It is now stirred, is strained and if too thick, more turpentine is added. Coach varnish is made in the same manner, only the oil and the resin are boiled for four hours, until quite stringy, when it is thinned with turpentine. When this varnish is employed without a drier it is very pliable, but it takes months to dry before it can be rubbed down and polished. To make it dry quick, some sulphate of zinc is mixed with it. The durability of varnishes, however, is injured by dryers.

IMPROVED SEED SOWING MACHINE.



Improved Seed Sower

Our engraving illustrates the invention of Mr. E. D. Curtis, of Mount Morris, N. Y., for which a patent was granted Nov. 15, 1855. The seed to be planted is contained in an oblong box, A, within which is a seed roller, B, (fig. 2) having pockets upon its periphery, which receive and discharge the grain into the channels, C C'. These channels pass down in the center of the plow shanks, to the ground. The plow shares, it will be observed, are placed respectively in the rear of each other, so that as fast as the front share opens a furrow the seed is deposited therein, and covered by the share next behind, and so with all.

The seed roller, B, is operated by means of a suitable gear wheel, E, put in motion by rod and pinion connected with shaft, F, of the driving wheels. Gear wheel D is connected with a shaft on the inside of the box, which stirs up the seed. The quantity of seed to be sowed per acre is regulated by changing the size of the gear wheels, which are so arranged as to be readily removed. G are levers, by which the discharge of seed from any one of the channels, C C', may be instantly shut off.

H (fig. 2) is a valve partition between the channels, C C'. H' is a handle, by which the partition, H, is changed so as to permit the seed to fall through both channels, or through only one, as desired.

The simplicity, strength, durability, and economy of manufacturing these seed planters will be obvious to every reader. Address the inventor as above, for further information.

Developement of Races of Animals.

Oken and the author of the "Vestiges of Creation" have endeavored to prove that the different races of animals now existing are developements, not separate creations, and that life on our earth commenced in a very imperfect condition, and through myriads of ages gradually improved—developed—into its present diversified expanded perfections. Hugh Miller completely exploded this theory, so far as it related to *all* life commencing at a *point*, and developing upwards, still he admits, in his "Footsteps of the Creator," that successive creations of races exhibit improvements, or rather developements, and so does Agassiz, and thus they grant half the argument, at least, to those who believe in the gradual developement of life from a mite up to a man. In reference to such disputations among naturalists Dr. Daubeny, of England, distinguished for his scientific attainments, says in his Presidential Address before the late meeting of the British Scientific Association:—

"Among the principles recently regarded as axioms in geology none seemed so likely to be disputed as this: That the classes of animals and vegetables which possessed the most complicated structure were preceded by others of a more simple one; and that when we traced back the succession of beings to the lowest and the earliest of the sedimentary formations, we arrived at length at a class of rocks, the deposition of which must be inferred, from the almost entire absence of organic remains, to have followed soon after the first dawn of creation. But the recognition of the footsteps and remains of reptiles in beds of an earlier date than was before assigned to them, tended to corroborate the inferences which had been previously deduced from the discovery, in a few rare instances, in rocks of the secondary age, of mammalian remains, and this has induced certain eminent geologists boldly to dispute whether from the earliest to the latest period of the earth's history any gradation of beings can in reality be detected."

The Life of Seeds.

We suppose that almost every person has heard or read the story of some grains of wheat having been found in an Egyptian mummy, which were sown, vegetated and yielded grain after its kind. This case and some others of a rather dubious character have been adduced in evidence of the great vitality and longevity of seeds; but we have now very reliable and practical evidence throwing some discredit on such stories.

The British Scientific Association have, for the past fifteen years, been instituting inquiries and making experiments, through a committee of its members—with various kinds of seeds, of various ages. Their labors tend to show that none of the seeds which were tested, although placed in the most favorable circumstances that could be devised, vegetated after the age of 49 years; and only 20 out of 288 species did so after 20 years, while by far the largest number lost their germinating power in ten years.

It has long been known to agriculturists and florists, that fresh seeds—those of the preceding season—possess the greatest amount of vitality; and very many seeds lose their germinating power altogether, even when kept in dry situations—in the course of two years. In the selection of any kind of seed, care should be exercised, in selecting it according to its age, as well as its appearance; the plumpness of a seed, is not always the best sign of its quality for seeding purposes.

In 1801, London contained a population of 958,000; its population is now 2,500,000.

Prospectus

OF THE

SCIENTIFIC AMERICAN.

TWELFTH YEAR

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